

## VPDES PERMIT FACT SHEET

This document gives the pertinent information concerning the **reissuance** of the VPDES permit listed below. This permit is being processed as a **minor municipal** permit. The effluent limitations contained in this permit will maintain the Water Quality Standards of 9 VAC 25-260-00 et seq.

The discharge results from the operation of a **0.10 MGD extended aeration plant** serving the community of Riner. This permit action consists of revising the effluent limits for ammonia, biochemical oxygen demand (BOD<sub>5</sub>), *E. coli*, and total kjeldahl nitrogen, and revising the special conditions. (SIC Code: 4952)

1. **Facility Name and Address:**

***Riner WWTP***

755 Roanoke Street, Suite 2-I

Christiansburg, VA 24073

Location: 4351 Riner Road, Montgomery County, Virginia

2. **Permit No:** **VA0024040** Existing Permit Expiration Date: January 30, 2013

3. **Facility/ Owner Contacts:**

Robert C. Fronk, PE, PSA Wastewater Manager, [fronkrc@montgomerycountyva.gov](mailto:fronkrc@montgomerycountyva.gov)

Richard W. Burton, PSA Wastewater Manager, 540-320-7705; [burtonrw@montgomerycountyva.gov](mailto:burtonrw@montgomerycountyva.gov)

Robert M. Stull, Wastewater Operator, 540-382-6982; [stullrm@montgomerycountyva.gov](mailto:stullrm@montgomerycountyva.gov)

4. **Application Complete Date:** August 13, 2012

**Permit Drafted By:** Becky L. France, Water Permit Writer

Date: November 27, 2012 (Revised 11/29/12, 12/19/12, 1/11/13)

DEQ Regional Office: Blue Ridge Regional Office

Reviewed By: Kevin A. Harlow, Water Permit Writer

Reviewer's Signature: Kevin A. Harlow Date: 1/23/13

Public Comment Period Dates: From 12/23/12 To 1/21/13

5. **Receiving Stream Classification:**

Receiving Stream: Mill Creek (River Mile: 5.12)

Watershed ID: VAW-N21R (Little River/Indian Creek/Brush Creek)

River Basin: New River

River Subbasin: NA

Section: 2

Class: IV

Special Standards: v

7-Day, 10-Year Low Flow: 0.11 MGD 7-Day, 10-Year High Flow: 0.22 MGD

1-Day, 10-Year Low Flow: 0.10 MGD 1-Day, 10-Year High Flow: 0.18 MGD

30-Day, 5-Year Low Flow: 0.17 MGD Harmonic Mean Flow: 0.45 MGD

Tidal: No 303(d) Listed: Yes

**Attachment A** contains a copy of the flow frequency determination memorandum. The high flow months are from January through May.

6. **Operator License Requirements:** III7. **Reliability Class:** II8. **Permit Characterization:**

- ☐ Private                      ☐ Interim Limits in Other Document  
☐ Federal                      ☐ Possible Interstate Effect  
☐ State  
☒ POTW  
☐ PVOTW

9. **Wastewater Treatment System:** A description of the wastewater treatment system is provided below. See **Attachment B** for the wastewater treatment schematic and **Attachment C** for a copy of the site inspection report. Treatment units associated with the discharge are listed in the table below.

**Table I**  
**DISCHARGE DESCRIPTION**

<b>Outfall Number</b>	<b>Discharge Source</b>	<b>Treatment (Unit by Unit)</b>	<b>Flow (Design) (MGD)</b>
001	Riner WWTP	comminutor grit screen equalization basin aeration basins (2) secondary clarifiers (2) baffled septic tank ion exchange columns ultraviolet disinfection banks parshall flume aerobic sludge digesters (2)	0.10

The Riner WWTP operates a 0.10 MGD extended aeration plant. Wastewater from the surrounding community flows through a grinder pump, an equalization basin, and a comminutor. The facility has two treatment trains and each consists of a diffused aeration basin, secondary clarifier, and aerated sludge holding tank. Currently, the facility is operating only one treatment train. Effluent from the secondary clarifier flows into a 2,500 gallon baffled septic tank and is then pumped to five banks of double ion exchange columns. The discharge from the columns flows to ultraviolet light banks. After disinfection, the effluent flows through a Parshall flume and is discharged into Mill Creek.

10. **Sewage Sludge Use or Disposal:** A VPDES Sewage Sludge Permit Application Form was submitted for this facility to address disposal of sewage sludge from the wastewater treatment

facility. Sludge is aerobically digested and then dewatered on a portable belt filter press. The dewater sludge is transported to the Shawsville WWTP for further treatment (blending with sludge from the Shawsville, and Elliston-Lafayette WWTPs). The blended sludge is land applied under Shawsville's VPDES permit (VA0024031).

11. **Discharge Location Description:** A USGS topographic map which indicates the discharge location, any significant dischargers, any water intakes, and other items of interest is included in **Attachment D**. The latitude and longitude of the discharge are N 37°3'23", E 80°26'39".

Name of Topo: Riner Number: 081C

12. **Material Storage:** Lime is stored in a building onsite.
13. **Ambient Water Quality Information:** Memoranda or other information which helped to develop permit conditions (special water quality studies, STORET data, and any other biological and/or chemical data, etc.) are listed below.

Flow frequencies for the receiving stream were recalculated using revised gauge data. DEQ conducted several flow measurements just upstream of the outfall at Riner WWTP. The measurements and the same day daily mean values from a continuous record gauge upstream of the discharge point on the South Fork of the Roanoke River near Shawsville, Virginia were plotted on a logarithmic graph and the associated flow frequencies above the discharge point were determined from the graph. Critical stream flow values have not changed from the previous reissuance. **Attachment A** contains a copy of the flow frequency determination memorandum.

The nearest upstream STORET monitoring station (9-MLC005.44) is one-quarter mile above the discharge. The closest downstream monitoring station (9-MLC002.74) is almost two and one-half miles below the discharge. The 90<sup>th</sup> percentile pH, 90<sup>th</sup> percentile temperature, and mean hardness values were calculated from the upstream monitoring station (9-MLC005.44).

Riner WWTP discharges into the Little River/Indian Creek/Brush Creek Watershed (VAW-N21R). The 2010 303(d) report lists Mill Creek as impaired for not supporting the swimmable goal of the Clean Water Act. A TMDL addresses a 5.68 mile segment of Mill Creek beginning 0.4 miles upstream of the Route 8 bridge and extending to the confluence with Meadow Creek. The impairment is caused by exceedances of the fecal coliform criteria. The impairment source is listed as Nonpoint Source – Agriculture/Wildlife/Domestic Septage.

The 2005 update to the New River Basin Water Quality Management Plan (9 VAC 25-720-130) reported results from modeling on Mill Creek that demonstrated the creek could assimilate 7.5 kg/d of BOD<sub>5</sub> and 1.9 kg/d of total kjeldahl nitrogen. See **Attachment E** for a copy of an excerpt from this Plan.

14. **Antidegradation Review and Comments:** Tier 1 \_\_\_\_ Tier 2   X   Tier 3 \_\_\_\_

The State Water Control Board's Water Quality Standards includes an antidegradation policy (9 VAC 25-260-30). All state surface waters are provided one of three levels of antidegradation protection. For Tier 1 or existing use protection, existing uses of the water body and the water quality to protect these uses must be maintained. Tier 2 water bodies have water quality that is better than the water quality standards. Significant lowering of the water quality of Tier 2 waters is not allowed without an evaluation of the economic and social impacts. Tier 3 water bodies are exceptional waters and are so designated by regulatory amendment. The antidegradation policy prohibits new or expanded discharges into exceptional waters.

The antidegradation review begins with Tier determination. Mill Creek is not listed as a public water supply in the segment where the discharge is located. The receiving stream is listed on Part I of the 303(d) list for exceedances of water quality criteria for fecal coliform. According to Agency guidance, fecal coliform bacteria criteria should not be used relative to establishment of the antidegradation tier. There are no pollutant data that indicate that the water quality of the stream is not better than the water quality standards. Therefore, this segment of Mill Creek is classified as a Tier 2 water, and no significant degradation of existing quality is allowed.

For purposes of aquatic life protection in Tier 2 waters, "significant degradation" means that no more than 25 percent of the difference between the acute and chronic aquatic criteria values and the existing quality (unused assimilative capacity) may be allocated. For purposes of human health protection, "significant degradation" means that no more than 10 percent of the difference between the human health criteria and the existing quality (unused assimilative capacity) may be allocated. The antidegradation baselines for aquatic life and human health are calculated for each pollutant as follows:

**Antidegradation baseline (aquatic life) = 0.25 (WQS – existing quality) + existing quality**

**Antidegradation baseline (human health) = 0.10 (WQS – existing quality) + existing quality**

Where:

"WQS" = Numeric criterion listed in 9 VAC 25-260-00 et seq. for the parameter analyzed

"Existing quality" = Concentration of the parameter being analyzed in the receiving stream

When applied, these "antidegradation baselines" become the new water quality criteria in Tier 2 waters, and effluent limits must be written to maintain the antidegradation baselines for each pollutant. Antidegradation baselines have been calculated as described above and included in **Attachment H**.

This facility was on-line before November 28, 1975 prior to the establishment of the antidegradation policy in the Clean Water Act. So, antidegradation had not been applied to the old 0.035 MGD facility. In the summer of 2000, the facility was upgraded to 0.10 MGD. Antidegradation requirements apply to the upgraded facility and have been applied to this permit reissuance. For this facility, the existing water quality is defined as the water quality prior to the discharge from the 0.10 MGD facility. The antidegradation review was conducted as described

in Guidance Memo 00-2011, and complies with the antidegradation policy contained in Virginia's Water Quality Standards. The permit limits are in compliance with antidegradation requirements set forth in 9 VAC 25-260-30.

15. **Site Inspection:** Date: 6/20/12 Performed by: Becky L. France  
**Attachment C** contains a copy of the site inspection memorandum. The last DEQ technical compliance inspection was conducted on February 25, 2009 by Ryan Hendrix.
16. **Effluent Screening and Limitation Development:** DEQ Guidance Memo 00-2011 was used in developing all water quality based limits pursuant to water quality standards (9 VAC 25-260-5 et seq.). Antidegradation wasteload allocations (AWLAs) are calculated for those parameters for which the state of Virginia has established water quality criteria. Refer to **Attachments G and H** for the existing baseline calculations, antidegradation wasteload allocation spreadsheet, and effluent limit calculations. See **Table II** on page 18 for a summary of limits and monitoring requirements and **Table III** on pages 19-20 for details on changes to the effluent limits and monitoring requirements.

A. **Mixing Zone**

The MIXER program was run to determine the percentage of the receiving stream flow that could be used in the antidegradation wasteload allocation calculations. The program output indicated that 100 percent of the 7Q10 and 1Q10 may be used for calculating acute and chronic antidegradation wasteload allocations (AWLAs) for the facility. A copy of the printout from the MIXER run is enclosed in **Attachment H**.

B. **Effluent Limitations for Conventional Pollutants and Ammonia**

**Flow** – The permitted design flow of 0.10 MGD for this facility is taken from the previous permit and the application for the reissuance. In accordance with the VPDES Permit Manual, flow is to be measured on a continuous basis with totalizing, indicating, and recording equipment.

**pH** – Between October 2008 and September 2012, there were no exceedances of the pH limitations. The pH limits of 6.00 S.U. minimum and 9.00 S.U. maximum have been continued from the previous permit. These limits are now expressed as three significant figures to provide more accurate 90<sup>th</sup> percentile pH data analysis calculations for the permit reissuance. These limits are based upon the water quality criteria in 9 VAC 25-260-50 for Class IV receiving waters and are in accordance with federal technology-based guidelines, 40 CFR Part 133, for secondary treatment. Grab samples shall continue to be collected once per day.

**Total Suspended Solids (TSS)** – Between October 2008 and September 2012, there were two exceedances of the TSS limitations. TSS limits are technology-based requirements for municipal dischargers with secondary treatment required in accordance with 40 CFR Part 133. These limits of 30 mg/L (11 kg/d) monthly average and 45 mg/L (17 kg/d)

weekly average shall continue from the previous permit. Four hour composite samples shall continue to be collected once per week.

**Biochemical Oxygen Demand (BOD<sub>5</sub>), Dissolved Oxygen (DO)** – Between October 2008 and September 2012, there was one exceedance of the BOD<sub>5</sub> limitations (December 2010) and no exceedances of the DO limitation. The 2005 update to the New River Basin Water Quality Management Plan (9 VAC 25-720-130) reported results from modeling on Mill Creek that demonstrated the creek could assimilate 7.5 kg/d of BOD<sub>5</sub> from Riner WWTP. The current monthly average BOD<sub>5</sub> loading limit is lower and thus complies with the Water Quality Management Plan.

The downstream dissolved oxygen existing condition prior to the upgrade to the 0.10 MGD facility was calculated using the Regional Water Quality Model. The average effluent dissolved oxygen (6.0 mg/L) from one year of plant performance records, a BOD<sub>5</sub> of 30 mg/L, and a TKN of 5 mg/L were entered into the model. The model predicted a minimum instream dissolved oxygen concentration of 6.0 mg/L. In accordance with antidegradation policy, a decline of more than 0.20 mg/L below this existing concentration is not allowed. See **Attachment G** for the 0.035 MGD facility regional model output.

For this reissuance, the Regional Water Quality Model for Free Flowing Streams (Version 4.0) was run for the expanded 0.10 MGD facility with revised temperature and flow values. For the months of January through May, an initial DO concentration of 7.0 mg/L, a TKN value of 5.4 mg/L, and a BOD<sub>5</sub> of 19 mg/L were used in the model input. The model predicted no DO sag. These limits are sufficiently stringent and cannot be lowered because they are based on the Water Quality Management Plan. The current minimum limit of 7.0 mg/L for DO and BOD<sub>5</sub> limitations of 19 mg/L (7000 g/d) monthly average and 28 mg/L (11000 g/d) weekly average have been continued from the previous permit. Since there is no lowering of the DO below the baseline, these limits comply with antidegradation requirements.

For the months of June through December, an initial DO concentration of 6.6 mg/L, a TKN of 5.0 mg/L, and a BOD<sub>5</sub> of 17 were used in the model input. The model predicted a DO sag to 5.793 mg/L. This value is 0.207 mg/L below the existing condition of 6.0 mg/L. So, these effluent concentrations violate the antidegradation policy. When the input BOD<sub>5</sub> concentration was decreased to 16 mg/L the model predicted a DO sag to 5.802 mg/L. This value is 0.198 mg/L below the existing condition of 6.0 mg/L. These model inputs comply with antidegradation requirements. So, for the months of June through December, a revised minimum DO of 6.6 mg/L and BOD<sub>5</sub> limitations of 16 mg/L (6100 g/d) monthly average and 24 mg/L (9100 g/d) weekly average have been included in the permit. This monthly average loading is below the Water Quality Management Plan wasteload allocation of 7500 g/d (**Attachment E**) and thus complies with the Water Quality Management Plan.

BOD<sub>5</sub> samples shall continue to be collected weekly via four hour composite samples. DO shall be continue to be collected daily via grab samples.

**Total Kjeldahl Nitrogen (TKN), Ammonia** – Between October 2008 and September 2012, there were three exceedances of the TKN limitations and no exceedances of the ammonia limitations. The need for TKN and ammonia limits for the low flow months of June through December and high flow month of January through May has been reassessed using new pH and temperature data.

For the months of June through December, the Regional Water Quality Model predicts that TKN limitations of 5.0 mg/L monthly average will be adequate to protect water quality. A weekly average TKN limitation of 7.5 mg/L is calculated as 1.5 times the monthly average limit. As recommended in Guidance Memo 00-2011, the antidegradation wasteload allocations and a default ammonia concentration of 9 mg/L were input into the STATS program. For June through December, the STATS program indicated that ammonia limitations are needed. It is assumed that 3.0 mg/L of the refractory organic compounds associated with TKN will undergo biological decay (as suggested in the regional water quality model documentation). Given this assumption, the ammonia limits of 1.52 mg/L monthly average and 2.22 mg/L weekly average are more stringent than the TKN limits, and therefore TKN limits are not needed for June through December. Four hour composite samples shall continue to be collected once per week. The previous permit contained a schedule for compliance with the ammonia limitations and based on monitoring results, no further schedule has been included.

For January through May, the STATS program indicated that ammonia limits of 3.17 mg/L monthly average and 4.64 mg/L weekly average are needed. The monthly average limit of 3.17 mg/L is assumed to be equivalent to a TKN limit of 6.17 mg/L. The monthly TKN limit of 5.4 mg/L required by the Regional Water Quality Model is more stringent than the ammonia limit required by the STATS program. Therefore, a monthly average TKN limit of 5.4 mg/L has been included in the permit. This concentration limit corresponds to a loading limit of 2000 g/d. However, the 2005 update to the New River Water Quality Management Plan (9 VAC 25-720-130) requires a TKN loading of 1900 g/d. Therefore, the monthly loading limit for TKN of 1900 g/d has been continued from the previous permit. The weekly average TKN limitation is calculated as 1.5 times the monthly average limit (8.1 mg/L). The weekly average ammonia limit of 4.64 mg/L required by the STATS program is assumed to be equivalent to a TKN limit of 7.6 mg/L. This calculated value of 7.6 mg/L is more stringent than the calculated model value for TKN of 8.1 mg/L. Therefore, the more stringent weekly TKN limit of 7.6 mg/L (2900 g/d) has been continued from the previous permit. By including January through May TKN limits of 5.4 mg/L (1900 g/d) monthly average and 7.6 mg/L (2900 g/d) weekly, ammonia limits are not needed because the TKN limits are believed to also be protective of the ammonia water quality standards. Four hour composite samples shall continue to be collected once per week. Refer to **Attachment H** for the STATS program outputs for ammonia and **Attachment I** for a printout from the Regional Water Quality Model.

Backsliding to increase the January through May monthly average TKN concentration limit is allowed because new pH and temperature information has been used in this model run that was not available at the time of the previous reissuance. Note that the Regional Water Quality Model predicts that this TKN input will result in an insignificant dissolved oxygen sag that complies with antidegradation requirements. This new information exemption to backsliding is allowed in accordance with 9 VAC 25-31-220 L2.a of the VPDES Permit Regulation.

***E. coli*** -- Revised Water Quality Standards became effective on February 1, 2010, and included updates to the bacteria and disinfection policy in 9 VAC 25-260-170. The water quality criteria of 126 colony forming units (cfu)/100 mL (geometric average) and 235 cfu/100 mL (single sample maximum) have been applied at the end of the discharge pipe. The Water Quality Standards, 9 VAC 25-260-170, have been revised to indicate that the geometric mean "shall be calculated using all data collected during any calendar month with a minimum of four weekly samples. If there are insufficient data to calculate a monthly geometric mean..., no more than 10% of the total samples in the assessment period shall exceed 235 *E. coli* cfu/100 mL. "

The limit of 126 cfu/100 mL monthly average has been continued from the previous permit. If fewer than four weekly samples are collected during a discharge month, a single sample maximum limit of 235 cfu/100 mL applies. Grab samples shall be collected once per week between 8 AM and 4 PM. The permit also includes a special condition (Part I.C) describing these reporting requirements.

A bacteria Total Maximum Daily Load (TMDL) has been developed for the Mill Creek Watershed. The TMDL assigns a wasteload allocation of  $2.62E + 11$  cfu/year to this discharge. This wasteload allocation was based upon a fecal coliform limit of 200 cfu/100 mL and a design flow of 0.10 MGD for Riner WWTP.

Bacteria limits are written in terms of *E. coli* rather than fecal coliform. An *E. coli* geometric limit of 126 cfu/100 mL has been included in the permit. This limit is slightly more stringent than a fecal coliform limit of 200 cfu/100 mL. Therefore, the *E. coli* limit complies with the TMDL wasteload allocation. Refer to **Attachment E** for an excerpt from the EPA approved report which characterizes impairments and wasteload allocations.

#### **C. Effluent Limitation Evaluation for Toxic Pollutants**

In addition to the standard limitations, the discharge must be evaluated to determine whether there is a reasonable potential for the effluent to violate the water quality standards (WQSs) adopted by the State Water Control Board (9 VAC 25-260 et. seq). Toxic pollutant data submitted with the application were above the quantification level for ammonia as nitrogen. In 2003 and 2008 the permittee completed an analysis for metals, most pesticides and PCBs (EPA method 608), base neutral extractables, acid extractables, and volatiles. Total cyanide, sulfate, and tributyltin were also included.



Analysis results were below the quantification levels for all parameters except dissolved copper, dissolved silver, dissolved zinc, dissolved barium, dissolved manganese, sulfate, and tributyltin. These data are summarized in **Attachment F**. Since the receiving stream is not a public water supply, the water quality standards are not applicable to barium, manganese, or sulfate.

Tributyltin was detected at 0.32 µg/L. However, tributyltin was also detected in the blank, so the value does not represent the tributyltin concentration in the effluent. The treatment works does not receive wastewater from any significant industrial users so there are no known sources of tributyltin in the wastewater.

The water quality criteria for silver and AWLAs were calculated and are included in the spreadsheet in **Attachment H**. The acute and chronic AWLAs and the effluent data for dissolved silver were used as input in the Agency's STATS program to determine if limits were necessary. The program output indicates that a permit limit is not necessary for silver. A copy of the STATS program output is included in **Attachment H**.

**Copper, Total Recoverable** – The previous permit contained a schedule for compliance with the total recoverable copper limitations. The permittee installed an ion exchange filtration treatment system, and study data indicates that the permittee can be expected to meet the copper limitations. The copper limits have been reevaluated using the revised water quality criteria to determine if they are stringent enough. The revised AWLAs and dissolved copper data from 2008 were entered into the STATS program. The STATS program output indicates that limits of 14 µg/L monthly average and 14 µg/L weekly average are needed. These limits are being carried forward from the previous permit. Grab samples shall continue to be taken 1/month. See **Attachment H** for the AWLA spreadsheet and STATS program output.

**Temperature** -- Daily temperature monitoring via immersion stabilization has been continued from the previous permit. These data will be reported as a maximum daily average for the purposes of calculating the 90<sup>th</sup> percentile effluent temperature and calibrating the Regional Water Quality Model. The 90<sup>th</sup> percentile temperature is used in the AWLA spreadsheet calculations. The temperature water quality criteria as per 9 VAC 25-260-50 for this Class IV receiving stream is 29 °C.

**Total Residual Chlorine (TRC)** -- The facility uses ultraviolet light as the disinfection method. In the event that the facility decides to use TRC as an alternative method of disinfection methods, TRC limits have been established to avoid any future modifications to the permit. In the absence of TRC data, one data value, equal to the QL, was assumed to exist. This methodology is similar to that discussed in Guidance Memo 00-2011 for ammonia. Antidegradation wasteload allocations (AWLAs) have been established for TRC to protect the receiving stream from degradation. Since no data exist for the Tier 2 receiving stream, the baseline is equal to 25 percent of the criterion.

The acute and chronic AWLAs for TRC were input into the STATS program to calculate appropriate limits. Based on the Agency's STATS program, permit limits of 0.004 mg/L monthly average and 0.005 mg/L weekly average are required. These limits have been carried forward from the previous permit. Grab samples are required three times per day at four hour intervals. See **Attachment H** for the AWLA spreadsheet and STATS program output.

**Zinc, Total Recoverable** -- The previous permit contained a schedule for compliance with the total recoverable zinc limitations. The permittee installed an ion exchange filtration system and study data indicates that the permittee can be expected to meet the zinc limitations. The zinc limits have been reevaluated using the revised water quality criteria to determine if they are stringent enough. The revised AWLAs and dissolved zinc data from 2006 through 2008 were entered into the STATS program. The STATS program output indicates that limits of 110 µg/L monthly average and 110 µg/L weekly average are needed. These limits are being carried forward from the previous permit. Grab samples shall continue to be taken 1/month. See **Attachment H** for the AWLA spreadsheet and STATS program output.

17. **Basis for Sludge Use and Disposal Requirements:** Since the facility hauls sludge to a municipal wastewater treatment plant for further treatment and land application, there are no sludge limits or monitoring requirements.
18. **Antibacksliding Statement:** The monthly average concentration TKN limitation for January through May has increased from the previous permit term. Backsliding on this limit is allowed because new temperature information has been used in new the Regional Water Quality Model run that was not available at the time of the previous reissuance. Also, new temperature information for January through May resulted in lower minimum dissolved oxygen limit. Note that the Water Quality Model predicts that the TKN input for the January through May model run and the DO input for the June through December model run will result in an insignificant dissolved oxygen sag that complies with antidegradation requirements. This new information exemption to backsliding is allowed in accordance with 9 VAC 25-31-220 L2.a of the VPDES Permit Regulation. No other limits are less stringent than the previous permit.
19. **Compliance Schedules:** For this reissuance, there are no compliance schedules.
20. **Special Conditions:** A brief rationale for each special condition contained in the permit is given below.
  - A. **Total Residual Chlorine (TRC) Limitations and Monitoring Requirements (Part I.B)**

**Rationale:** Should the permittee elect to disinfect by chlorine rather than UV light, this condition establishes TRC concentration limits after chlorine contact and final TRC effluent limits and monitoring requirements. This condition is in accordance with chlorine criteria in 9 VAC 25-260-140 of the VPDES Permit Regulation. Also, 40 CFR

122.41(e) requires the permittee, at all times, to properly operate and maintain all facilities and systems of treatment in order to comply with the permit. These requirements ensure proper operation of chlorination equipment to maintain adequate disinfection.

**B. *E. coli* Reporting Requirements (Part I.C)**

Rationale: The Water Quality Standards, 9 VAC 25-260-170 establishes bacteria water quality standards. The standard set bacteria monitoring requirements. This special condition is needed to describe requirements for when there is insufficient data (four samples) to calculate a monthly geometric mean.

**C. Compliance Reporting (Part I.D.1)**

Rationale: In accordance with VPDES Permit Regulation, 9 VAC 25-31-190 J4 and 220 I, DEQ is authorized to establish monitoring methods and procedures to compile and analyze data on water quality. This condition is necessary when toxic pollutants are monitored by the permittee and a maximum level of quantification and/or a specific analytical method is required in order to assess compliance with a permit limit or to compare effluent quality with a numeric criterion. This condition also establishes protocols for calculation of reported values.

**D. 95% Capacity Reopener (Part I.D.2)**

Rationale: This condition requires that the permittee address problems resulting from high influent flows, in a timely fashion, to avoid non-compliance and water quality problems from plant overloading. This requirement is required by 9 VAC 25-31-200 B4 for all POTW and PVOTW permits.

**E. Indirect Dischargers (Part I.D.3)**

Rationale: This condition is required by VPDES Permit Regulation, 9 VAC 25-31-200 B1 for POTWs and PVOTWs that receive waste from someone other than the owner of the treatment works.

**F. CTC, CTO Requirement (Part I.D.4)**

Rationale: This condition is required by Code of Virginia § 62.1-44.19 and the Sewage Collection and Treatment Regulations, 9 VAC 25-790.

**G. Operations and Maintenance Manual Requirement (Part I.D.5)**

Rationale: An Operations and Maintenance Manual is required by the Code of Virginia § 62.1-44.19; the Sewage Collection and Treatment Regulations, 9 VAC 25-790; and the VPDES Permit Regulation, 9 VAC 25-31-190 E.

**H. Licensed Operator Requirement (Part I.D.6)**

Rationale: The VPDES Permit Regulation, 9 VAC 25-31-200 C, Code of Virginia 54.1-2300 et seq., and Rules and Regulations for Waterworks and Wastewater Works Operators (18 VAC 160-20-10 et seq.) require licensure of operators. A Class III operator is required for this facility.

**I. Reliability Class (Part I.D.7)**

Rationale: A Reliability Class II has been assigned to this facility. Reliability class designations are required by Sewage Collection and Treatment Regulations, 9 VAC 25-790 for all municipal facilities.

**J. Sludge Reopener (Part I.D.8)**

Rationale: This condition is required by VPDES Permit Regulation, 9 VAC 25-31-220 C for all permits issued to treatment works treating domestic sewage to allow incorporation of any applicable standard for sewage sludge use or disposal promulgated under section 405(d) of the Clean Water Act.

**K. Sludge Use and Disposal (Part I.D.9)**

Rationale: VPDES Permit Regulation, 9 VAC 25-31-100 P; 220 B2; and 420 and 720, and 40 CFR Part 503 require all treatment works treating domestic sewage to submit information on sludge use and disposal practices and to meet specified standards for sludge use and disposal. Technical requirements may be derived from the VPA Permit Regulations, 9 VAC 5-32-10 et seq. This special condition, in accordance with Guidance Memo No. 97-004, clarifies that the Sludge Management Plan approved with the reissuance of this permit is an enforceable condition of the permit.

**L. Total Maximum Daily Load (TMDL) Reopener (Part I.D.10)**

Rationale: Section 303(d) of the Clean Water Act requires that Total Maximum Daily Loads (TMDLs) be developed for streams listed as impaired. This special condition is to allow the permit to be reopened if necessary to bring it into compliance with any applicable TMDL approved for the receiving stream. The reopener recognizes that according to Section 402(o)(1) of the Clean Water Act, limits and/or conditions may be either more or less stringent than those contained in this permit. Specifically, they can be relaxed if they are the result of a TMDL, basin plan, or other wasteload allocation prepared under Section 303 of the Act.

**M. Treatment Works Closure Plan (Part I.D.11)**

Rationale: In accordance with State Water Control Law § 62.1-44.19, this condition is used to notify the owner of the need for a closure plan where a treatment works is being replaced or is expected to close.

**N. Permit Application Requirement (Part I.D.12)**

Rationale: VPDES Permit Regulation, 9 VAC 25-31-100.D and 40 CFR 122.21(d)(1) require submission of a new application at least 180 days prior to expiration of the existing permit. In addition, the VPDES Permit Regulation, 9 VAC 25-31-100 E.1 and 40 CFR 122.21 (e)(1) note that a permit shall not be issued before receiving a complete application.

**O. Significant Discharger Survey (Part I.E)**

Rationale: VPDES Permit Regulation, 9 VAC 25-31-730 through 900, and 40 CFR Part 403 require certain existing and new sources of pollution to meet specified regulations.

**P. Conditions Applicable to All VPDES Permits (Part II)**

Rationale: VPDES Permit Regulation, 9 VAC 25-31-190 requires all VPDES permits to contain or specifically cite the conditions listed.

**21. Changes to the Permit:**

**A. The following special condition has been deleted from the permit:**

1. The Schedule of Compliance Special Condition (Part I.C) has been removed because the schedule for achieving compliance with the ammonia, copper, and zinc limits has been met.
2. The Water Quality Criteria Monitoring Special Condition (Part I.D.11) has been removed because the data have been submitted.

**B. Special conditions that have been modified from the previous permit are listed below: (The referenced permit sections are for the new permit.)**

1. The Compliance Reporting Special Condition (Part I.D.1) has been revised to include information about significant figures.
2. The Operations and Maintenance Manual Special Condition (Part I.D.5) has been revised in accordance with the VPDES Permit Manual.

C. **The following new special condition added to the permit are listed below:**

1. An *E. coli* Reporting Requirements Special Condition (Part I.C) has been added to comply with the Water Quality Standards 9 VAC 25-260-170 for when there are insufficient data (four samples) to calculate a monthly geometric mean.
2. A Facility Closure Plan Special Condition (Part I.D.12) has been added in accordance with the VPDES Permit Manual to provide requirements in the event the facility is closed.
3. A Permit Application Requirement Special Condition (Part I.D.13) has been added to provide the specific due date for the required submittal of the application.

D. **Permit Limits and Monitoring Requirements:** See Table III on pages 19-20 for details on changes to the effluent limits and monitoring requirements.

22. **Variances/Alternate Limits or Conditions:** No variances or alternate limits or conditions are included in this permit. The permittee requested that the 4-hour composite data for TSS and BOD<sub>5</sub> collected during the permit term be used on the application in lieu of 24-hour composite samples. A waiver was requested to allow one pollutant scan instead of 3 samples for ammonia as nitrogen, nitrate + nitrite, oil and grease, and dissolved solids. Additionally, it was requested that one pollutant scan be allowed from the aerobic sludge digester to test for arsenic, cadmium, chromium, copper, lead, mercury, molybdenum, nickel, selenium, and zinc. These waivers were consistent with current permit requirements, and therefore they were granted.
23. **Regulation of Treatment Works Users:** The VPDES Permit Regulation, 9 VAC 25-31-280 B9, requires that every permit issued to a treatment works owned by a person other than a state or municipality provide an explanation of the Board's decision on the regulation of users. Montgomery County, a municipality, owns this treatment works; therefore this regulation does not apply. The permit requires that the facility submit a Significant Industrial Survey (Part I.E).
24. **Public Notice Information required by 9 VAC 25-31-290 D:**

All pertinent information is on file and may be inspected, and arrangements made for copying by contacting Becky L. France at:

Virginia DEQ, Blue Ridge Regional Office  
3019 Peters Creek Road  
Roanoke, VA 24019  
540-562-6700  
[becky.france@deq.virginia.gov](mailto:becky.france@deq.virginia.gov)

Persons may comment in writing or by e-mail to the DEQ on the proposed permit action and may request a public hearing during the comment period. Comments shall include the name, address,

and telephone number of the writer, and shall contain a complete, concise statement of the factual basis for comments. Only those comments received within this period will be considered. The DEQ may decide to hold a public hearing if public response is significant. Requests for public hearings shall state the reason why a hearing is requested, the nature of the issues proposed to be raised in the public hearing, and a brief explanation of how the requester's interests would be directly and adversely affected by the proposed permit action.

Following the comment period, the DEQ will make a determination regarding the proposed permit action. This determination will become effective, unless the DEQ grants a public hearing. Due notice of any public hearing will be given. See **Attachment J** for a copy of the public notice.

25. **303(d) Listed Segments (TMDL):** This facility discharges directly to Mill Creek. The stream segment is located in the Little River/Indian Creek/Brush Creek Watershed (VAW-N21R). This watershed is listed on the 2010 303(d) list as impaired due to bacteria. The Mill Creek Total Maximum Daily Load (TMDL) report entitled *Fecal Coliform TMDL for Mill Creek Watershed, Virginia* was approved by EPA on June 5, 2002 and by the State Water Control Board on June 17, 2004. The report study area includes 5.68 miles of Mill Creek beginning 0.4 miles upstream of the Route 8 bridge and ending at the confluence with Meadow Creek. A wasteload allocation of  $2.62E + 11$  cfu/year has been set for Riner WWTP. This wasteload allocation is based upon a design capacity of 0.100 MGD and a fecal coliform concentration of 200 cfu/100 mL. Bacteria limits are written in terms of *E. coli* rather than fecal coliform. An *E. coli* geometric limit of 126 cfu/100 mL has been included in the permit. This limit is slightly more stringent a fecal coliform limit of 200 cfu/100 mL. Therefore, the *E. coli* limit complies with the TMDL wasteload allocation. Refer to **Attachment E** for an excerpt from the EPA approved report which characterizes impairments and wasteload allocations.

26. **Additional Comments:**

- A. **Reduced Effluent Monitoring:** In accordance with Guidance Memo 98-2005, all permit applications received after May 4, 1998, are considered for reduction in effluent monitoring frequency. Only facilities having exemplary operations that consistently meet permit requirements may qualify for reduced monitoring. To qualify for consideration of reduced monitoring requirements, the facility should not have been issued any Warning Letters, Notices of Unsatisfactory Laboratory Compliance, Letter of Noncompliance (LON) or Notices of Violation (NOV), or be under any Consent Orders, Consent Decrees, Executive Compliance Agreements, or related enforcement documents during the past three years.

The facility received the following Warning Letters within the past three years:

Warning Letter No. W2001-05-W1003	TKN exceedances
Warning Letter No. W2001-05-W-1006	TKN exceedances
Warning Letter No. W2011-02-W-1002	BOD <sub>5</sub> and TSS exceedances

The facility does not meet the criteria discussed above and therefore is not eligible for reduced monitoring.

- B. **Previous Board Action:** The permittee entered into a Letter of Agreement with DEQ on January 18, 2011 to replace the ultraviolet (UV) disinfection system. The permittee notified DEQ that the UV system installation was completed on May 14, 2011. DEQ staff issued a closure memo for the Letter of Agreement on June 10, 2011.

- C. **Staff Comments:** The discharge is not controversial, and is in conformance with the existing planning document for the area. The permit is being reissued for a period of less than five years to even out the DEQ staff permitting workload.

On December 19, 2012, the draft permit was modified to provide tiered limits for BOD<sub>5</sub> and dissolved oxygen. On January 11, 2013 minor revisions to the *E. coli* monitoring requirements (Part I.C) were made to clarify applicability of limits.

- D. **Public Comments:** On January 11, 2013, the permittee commented on *E. coli* monitoring requirements. See **Attachment J** for comments and response.

E. **Tables**

Table I	Discharge Description (Page 2)
Table II	Basis for Monitoring Requirements (Pages 18)
Table III	Permit Processing Change Sheets (Pages 19-20)

F. **Attachments**

- A. Flow Frequency Memorandum
- B. Wastewater Schematics
- C. Site Inspection Report
- D. USGS Topographic Map
- E. Ambient Water Quality Information
  - STORET Data (Station 9-MLC005.44)
  - 2010 Impaired Waters Summary (Excerpt)
  - 2005 New River Water Quality Management Plan Summary
  - Fecal Coliform TMDL for Mill Creek Watershed (Excerpt)
- F. Effluent Data
- G. Preexisting Baseline Effluent Data (0.035 MGD)
- H. Wasteload and Limit Calculations
  - Mixing Zone Calculations (MIXER 2.1)
  - Antidegradation Wasteload Allocation Spreadsheet
  - STATS Program Results (ammonia, copper, silver, TRC, zinc)



- I. Water Quality Model Calculations
- J. Public Notice and Comments
- K. EPA Checksheet

**Table II**  
BASIS FOR LIMITATIONS – MUNICIPAL

( ) Interim Limitations  
(x) Final Limitations

OUTFALL: 001  
DESIGN CAPACITY: 0.10 MGD

Effective Dates - From: Effective Date  
To: Expiration Date

PARAMETER	BASIS FOR LIMITS	DISCHARGE LIMITS				MONITORING REQUIREMENTS	
		Monthly Average	Weekly Average	Minimum	Maximum	Frequency	Sample Type
Flow (MGD)	NA	NL	NA	NA	NL	Continuous	TIRE
pH (Standard Units)	1,2	NA	NA	6.00	9.00	1/Day	Grab
BOD <sub>5</sub> (Jan. – May)	3	19 mg/L 7000 g/d	28 mg/L 11,000 g/d	NA	NA	1/Week	4 HC
BOD <sub>5</sub> (June – Dec.)	3	16 mg/L 6100 g/d	24 mg/L 9100 g/d	NA	NA	1/Week	4 HC
Total Suspended Solids	1	30 mg/L 11 kg/d	45 mg/L 17 kg/d	NA	NA	1/Week	4 HC
Dissolved Oxygen (Jan. – May)	2,3	NA	NA	7.0 mg/L	NA	1/Day	Grab
Dissolved Oxygen (June – Dec.)	2,3	NA	NA	6.6 mg/L	NA	1/Day	Grab
Total Kjeldahl Nitrogen (Jan. – May)	2,3	5.4 mg/L 1900 g/d	7.6 mg/L 2900 g/d	NA	NA	1/Week	4 HC
Temperature	2	NA	NA	NA	NL °C	1/Day	IS
<i>E. coli</i>	2,4	126 cfu/ 100 mL	NA	NA	235 cfu/ 100 mL	1/Week	Grab
Ammonia as Nitrogen (June - Dec.)	2	1.52 mg/L	2.22 mg/L	NA	NA	1/Week	4HC
Copper, Total Recoverable	2	14 µg/L	14 µg/L	NA	NA	1/Month	Grab
Zinc, Total Recoverable	2	110 µg/L	110 µg/L	NA	NA	1/Month	Grab

NA = Not Applicable  
NL = No Limitations; monitoring only  
4HC= 4 hour composite  
IS = immersion stabilization  
TIRE = totalizing, indicating, recording equipment

The basis for the limitations codes are:

1. Federal Technology-Based Secondary Treatment Regulation (40 CFR Part 133)
2. Water Quality Criteria
3. Regional Water Quality Model
4. Total Maximum Daily Load (Fecal Coliform TMDL for Mill Creek Watershed)

**Table III-1**  
**PERMIT PROCESSING CHANGE SHEET**

**LIMITS AND MONITORING SCHEDULE:**

Outfall No.	Parameter Changed	Monitoring Requirement Changed		Effluent Limits Changed		Reason for Change	Date
		From	To	From	To		
001	BOD <sub>5</sub> (June – Dec.)			19 mg/L (7 kg/d) monthly average; 28 mg/L (11 kg/d) weekly average	16 mg/L (6100 g/d) monthly average; 24 mg/L (9100 g/d) weekly average	New higher 90 <sup>th</sup> percentile temperature for low flow months used in Regional Water Quality Model. Model output indicated more stringent limitations needed.	10/22/12
001	Ammonia as Nitrogen (June – Dec.)			1.8 mg/L monthly average; 2.6 mg/L weekly average	1.52 mg/L monthly average; 2.22 mg/L weekly average	New temperature and pH data resulted in revised AWLAs. STATS program indicated the need for more stringent ammonia limitations.	10/22/12
001	Dissolved Oxygen (June – Dec.)			7.0 mg/L daily minimum	6.6 mg/L daily minimum	January through December BOD <sub>5</sub> limits replaced by tiered limits for high and low flow months. New flow and temperature data during the high flow months of Jan. – Dec. was used in the Regional Water Quality Model. A more stringent TKN value was input into the Model to adjust the DO limitation. Model output indicated less stringent limitation needed. Backsliding allowed due to new information.	12/18/12
001	Total Kjeldahl Nitrogen (Jan. – May)			5.1 mg/L (1900 g/d) monthly average; 7.6 mg/L (2900 g/d)	5.4 mg/L (1900 g/d) monthly average; 7.6 mg/L (2900 g/d)	New temperature used in Regional Water Quality Model. Model output indicated less stringent limitation for needed with more stringent BOD <sub>5</sub> limitations. Backsliding allowed due to new information.	10/22/12
001	<i>E. coli</i>			126 cfu/100 mL (geometric mean)	126 cfu/100 mL (geometric mean) or 235 N/100 mL maximum	Water Quality Standards revised to require geometric mean to be calculated from 4 samples. Alternative maximum limit applies if less than 4 samples collected during the month.	10/22/12

**Table III-2**  
**PERMIT PROCESSING CHANGE SHEET**

**LIMITS AND MONITORING SCHEDULE:**

Outfall No.	Parameter Changed	Monitoring Requirement Changed		Effluent Limits Changed		Reason for Change	Date
		From	To	From	To		
001	Total Residual Chlorine (applicable if facility uses chlorine disinfection)	1/day	3/day at 4 hour intervals	0.004 mg/L monthly average; 0.005 mg/L weekly average	0.004 mg/L monthly average; 0.004 mg/L weekly average	Frequency revised in accordance with VPDES Permit Manual. STATS program statistics for increased frequency yielded revised limit.	11/28/12

## **Attachment A**

### **Flow Frequency Memorandum**


## MEMORANDUM

### DEPARTMENT OF ENVIRONMENTAL QUALITY - WATER DIVISION 3019 Peters Creek Road, Roanoke, Virginia 24019

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**SUBJECT:** Flow Frequency Determination  
Riner WWTP – (VA0024040)

**TO:** Permit File

**FROM:** Becky L. France, Water Permit Writer 

**DATE:** October 11, 2012 (1/15/13)

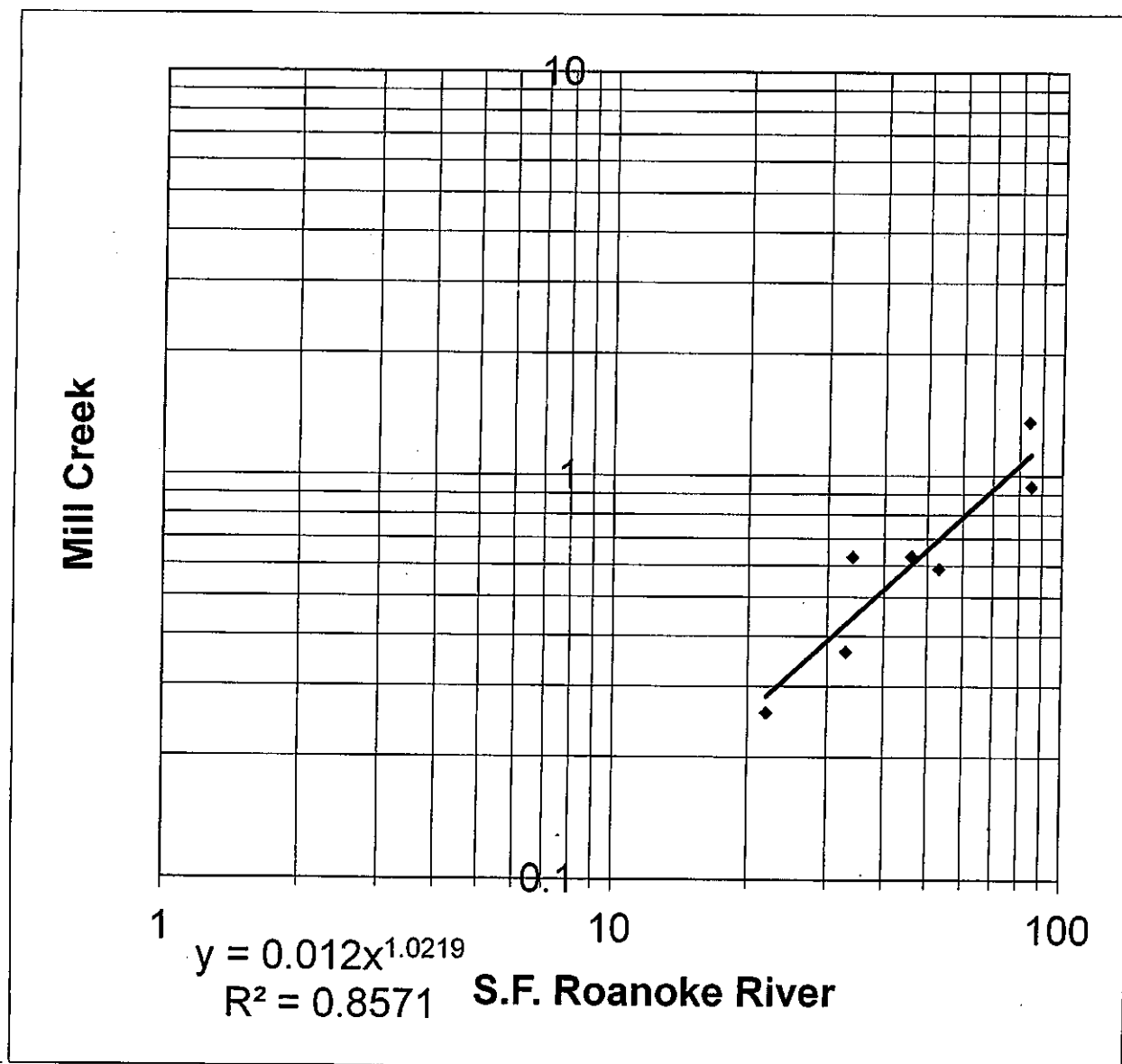
Riner WWTP discharges to Mill Creek near Riner, Virginia. Stream flow frequencies are required at this site to develop effluent limitations for the VPDES permit.

DEQ conducted several flow measurements on Mill Creek from 1993 to 1997. The measurements were made just upstream of the Riner WWTP discharge. The measurements correlated very well with the same day daily mean values from the downstream continuous record gauge on the South Fork of the Roanoke River near Shawsville, Virginia #02053800. The measurements and daily mean values were plotted on a logarithmic graph and a best fit line was drawn through the data points. The required flow frequencies from the reference gauge were plotted on the regression line and the associated flow frequencies at the measurement site were calculated.

This analysis assumes there are no significant discharges, withdrawals, or springs influencing the flow in Mill Creek upstream of the discharge point. The high flows are January through May. Flow frequencies for the reference gauge, the measurement site, and the discharge point are listed on the attached tables.

Mill Creek above Riner, VA (#03170100)

vs S.F. Roanoke River, VA (#02053800)

Flow Data (cfs)

Date	SF Roanoke	Mill Creek
8/30/1993	33	0.366
5/23/1994	85	0.941
9/23/1994	46	0.633
8/7/1995	34	0.63
9/26/1996	84	1.36
6/30/1997	53	0.589
9/8/1997	22	0.258

## SUMMARY OUTPUT

<u>Regression Statistics</u>	
Multiple R	0.906179
R Square	0.82116
Adjusted R Squa	0.785392
Standard Error	0.171275
Observations	7

Flow Frequencies (cfs)

SF Roanoke		Mill Creek
11.9	1Q10	0.151
13	7Q10	0.166
20	30Q5	0.256
16.9	30Q10	0.216
22	HF 1Q10	0.282
26	HF 7Q10	0.335
53	HM	0.694
37	HF30Q10	0.481
109 mi <sup>2</sup>	DA	2.12 mi <sup>2</sup>
	Jan-May	

Reference Gauge (data from 1961 to 2003)					
S.F. Roanoke River near Shawsville, VA (#02053800)					
Drainage Area [ mi <sup>2</sup> ] =		109		mi <sup>2</sup>	
	ft <sup>3</sup> /s	MGD		ft <sup>3</sup> /s	MGD
1Q10 =	11.9	7.7	High Flow 1Q10 =	22	14
7Q10 =	13.1	8.5	High Flow 7Q10 =	26	17
30Q5 =	20	13	High Flow 30Q10 =	37	24
30Q10 =	16.9	11	HM =	53	34

Flow frequencies from Regression Analysis above Riner WWTP					
Mill Creek at Riner, VA (#03170100)					
Drainage Area [ mi <sup>2</sup> ] =		2.12		mi <sup>2</sup>	
	ft <sup>3</sup> /s	MGD		ft <sup>3</sup> /s	MGD
1Q10 =	0.15	0.10	High Flow 1Q10 =	0.28	0.18
7Q10 =	0.17	0.11	High Flow 7Q10 =	0.34	0.22
30Q5 =	0.26	0.17	High Flow 30Q10	0.48	0.31
30Q10 =	0.22	0.14	HM =	0.69	0.45



## SUMMARY OUTPUT

<i>Regression Statistics</i>	
Multiple R	0.906179
R Square	0.82116
Adjusted R	0.785392
Standard E	0.171275
Observatio	7

## ANOVA

	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regressor	1	0.673474	0.673474	22.95794	0.004921
Residual	5	0.146676	0.029335		
Total	6	0.82015			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
Intercept	-0.00305	0.157028	-0.01941	0.985264	-0.4067	0.400603	-0.4067	0.400603
X Variable	0.013441	0.002805	4.791445	0.004921	0.00623	0.020652	0.00623	0.020652

## RESIDUAL OUTPUT

<i>Observation</i>	<i>Predicted Y</i>	<i>Residuals</i>	<i>Standard Residuals</i>
1	0.440496	-0.0745	-0.47646
2	1.139413	-0.19841	-1.26902
3	0.615225	0.017775	0.113686
4	0.453936	0.176064	1.126073
5	1.125972	0.234028	1.496801
6	0.70931	-0.12031	-0.76948
7	0.292648	-0.03465	-0.2216

Mill Creek at Riner, VA  
Station ID No. 03170100  
Lat 37 03'23", Long 80 26'38", NAD 83  
Montgomery County

SITEID	RECORD	DATE	DISCH	QUAD	DAAREA
03170100	MQ, 1993-98	8/30/1993	0.366 Riner		2.12
03170100	MQ, 1993-98	5/23/1994	0.941 Riner		2.12
03170100	MQ, 1993-98	9/23/1994	0.633 Riner		2.12
03170100	MQ, 1993-98	8/7/1995	0.63 Riner		2.12
03170100	MQ, 1993-98	9/26/1996	1.36 Riner		2.12
03170100	MQ, 1993-98	6/30/1997	0.589 Riner		2.12
03170100	MQ, 1993-98	9/8/1997	0.258 Riner		2.12

South Fork Roanoke River at Shawsville, Va.

Station No. 02053800

Montgomery County

Ironto Quad

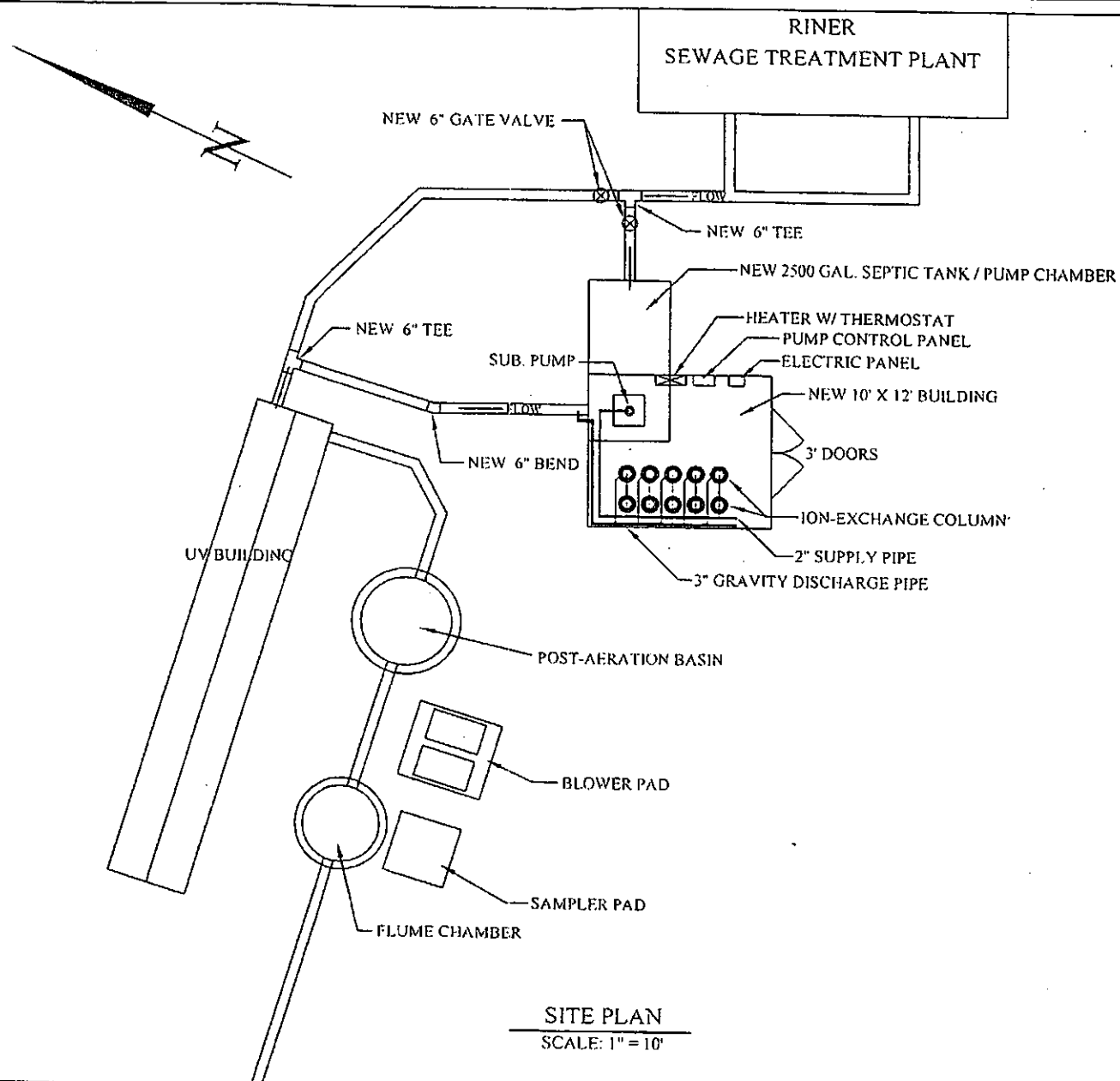
Lat 37 08'24", Long 80 15'59", NAD 83

Roanoke River Basin

RECORD	DaArea	Hmean	HF30Q10	HF7Q10	HF1Q10	Z30Q5	Z30Q10	Z7Q10	Z1Q10	Z1Q30	HFMTHS	StaPeriod	YRSTRN
R, 1960-	109	53	37	26	22	20	16.9	13.1	11.9	8.7	JAN-MAY	1961-2011	2012

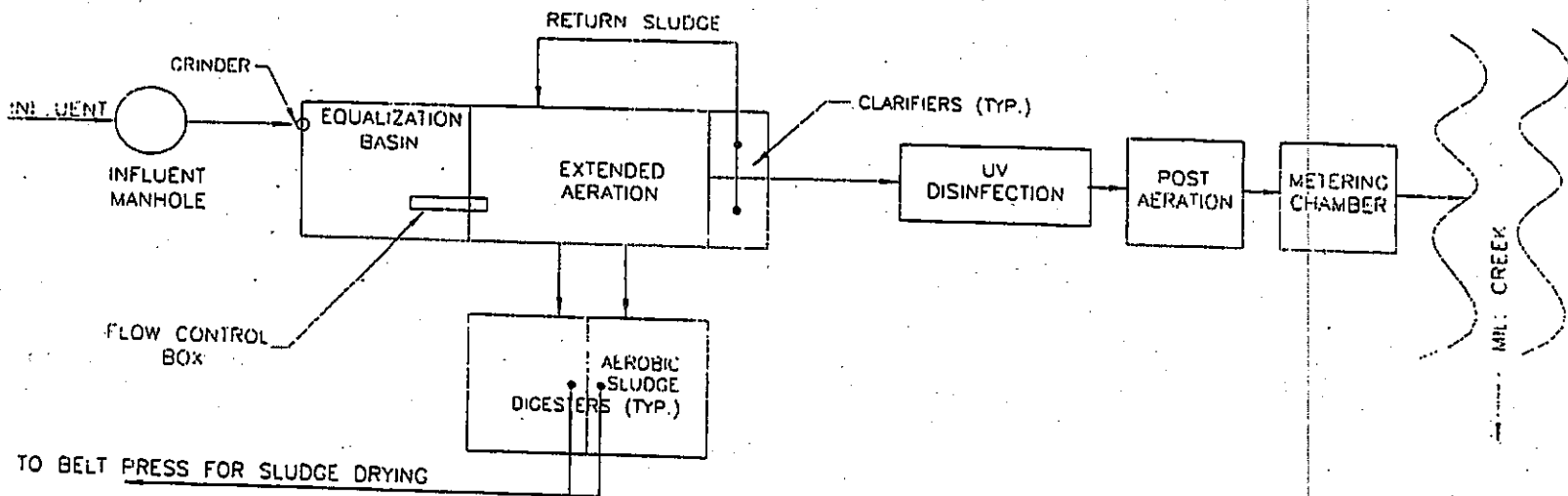
**Attachment B**

**Wastewater Schematics**



MONTGOMERY COUNTY PUBLIC SERVICE AUTHORITY  
755 ROANOKE ST. CHRISTIANSBURG, VA 24073  
PH: 540-381-1997; FAX: 540-382-5703

RINER WASTEWATER TREATMENT PLANT  
VPDES PERMIT VA0024040  
COPPER & ZINC REMOVAL SYSTEM INSTALLATION  
JULY 9, 2012



# RINER WASTEWATER TREATMENT PLANT

## FLOW DIAGRAM

FIGURE 1



ANDERSON  
AND  
ASSOCIATES, Inc.

Engineers  
Surveyors  
Planners

Richmond, VA  
Greensboro, NC  
Midlothian, VA  
Richmond, VA  
Franklin, VA

DRAWN MGG	SCALE N.T.S.	DATE 31 JUL 00	DOCUMENT NO. 13254-031
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## **Attachment C**

### **Site Inspection Report**

MEMORANDUM


DEPARTMENT OF ENVIRONMENTAL QUALITY  
*Blue Ridge Regional Office*

3019 Peters Creek Road

Roanoke, VA 24019

SUBJECT: Site Inspection Report for Riner WWTP  
Reissuance of VPDES Permit No. VA0024040

TO: Permit File

FROM: Becky L. France, Water Permit Writer 

DATE: July 18, 2012 (Revised 11/29/12)

On June 20, 2012, a site inspection of the Riner WWTP was conducted. Mr. Bruce Jones, Water/Wastewater Supervisor and Mr. Ronald Akers, operator, were present at the inspection.

The Riner WWTP is a 0.10 MGD extended aeration package treatment plant with dual treatment trains. Wastewater flows through a grinder pump, an equalization basin, and a comminutor. Each of the two treatment trains consists of a diffused aeration basin, secondary clarifier, and aerated sludge holding tank. The facility is currently operating only one of the treatment trains with the exception that during periods of high flow wastewater is temporarily diverted into the second aeration basin. The permittee plans to install an ion exchange system within the next few months for copper and zinc removal.

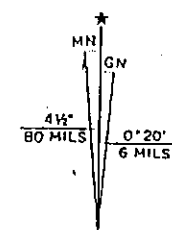
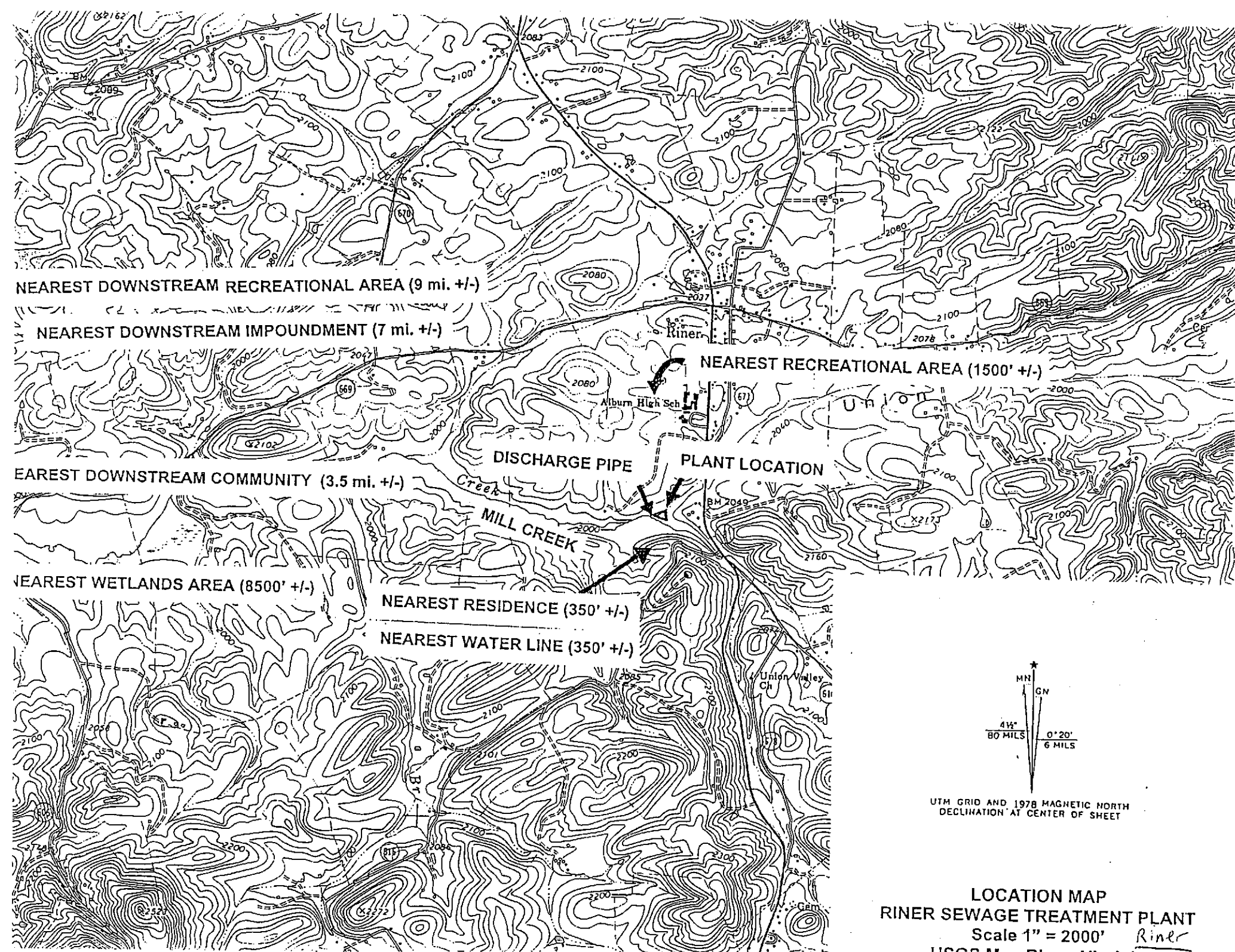
Wastewater enters the plant from a 6-inch force main and flows through a comminutor chamber or manual bar screen channel to the equalization basin. Then, the influent is pumped into an aeration basin. The aerators are run on an alternating 30 minute cycle. At the time of the site visit, the wastewater had a chocolate color, and there was some foam floating on top. The wastewater is then routed to one of the clarifiers. At the time of the site visit, there was some wastewater in the second aeration basin and clarifier due to temporary routing during high flows. From the clarifier, the wastewater overflows the weir and enters a splitter box which divides the flow between two banks of ultraviolet lights. The facility has a second backup set of ultraviolet lights that was out of service at the time of the site visit. The ultraviolet (UV) disinfection system consists of three light banks with four modules for each bank. Each module has two lamps. The UV disinfection system is housed in a building with heat lamps due to difficulties with freezing temperatures in the winter. Disinfected effluent flows into a post aeration tank. The effluent then passes through a 3-inch Parshall flume with ultrasonic flow meter and is discharged to Mill Creek. There was no visible foam at the discharge point.

Sludge and solids from the clarifier are routed to two 15,000 gallon aerated digesters. Approximately twice per year, a portable belt press is brought to the plant to dewater the digested sludge. The dewatered sludge is hauled to the Shawsville WWTP where it is blended with sludge from the Shawsville WWTP and the Elliston-Lafayette WWTP. The blended sludge is land applied in accordance with the Shawsville WWTP VPDES permit.



## **Attachment D**

### **USGS Topographic Map**



UTM GRID AND 1978 MAGNETIC NORTH  
DECLINATION AT CENTER OF SHEET

LOCATION MAP  
RINER SEWAGE TREATMENT PLANT  
Scale 1" = 2000' Riner  
USGS Map No. 1111

## **Attachment E**

### **Ambient Water Quality Information**

- **STORET Data (Station 9-MLC005.44)**
- **2010 Impaired Waters Report  
(Excerpt)**
- **2005 New River Water Quality  
Management Plan Summary**
- **Fecal Coliform TMDL for Mill Creek  
Watershed (Excerpt)**

Watershed Code VAW-N21R  
 Station No. 9-MLC005.44 (Route 8 bridge - above Riner STP)

Collection Date Time	Hardness, Total (mg/L as CaCO <sub>3</sub> )
1/10/1991 10:30	152
9/23/1991 10:45	236
2/2/1992 11:00	214
2/10/1992 11:00	223
5/6/1992 11:30	198
8/10/1992 11:30	240
5/3/1993 11:00	188
8/4/1993 11:30	238
11/4/1993 10:30	246
2/1/1994 10:30	178
8/2/1994 10:30	198
11/3/1994 10:30	234
2/21/1995 10:30	163
5/4/1995 10:30	202
7/31/1995 10:00	230
11/1/1995 13:30	229
2/8/1996 10:00	184
5/1/1996 11:00	160
8/1/1996 10:30	205
11/4/1996 10:30	217
2/3/1997 9:30	177.6
5/1/1997 11:00	170
9/25/1997 9:30	236
11/3/1997 9:30	214
2/9/1998 10:00	138
5/21/1998 10:30	184
8/13/1998 10:30	235
11/4/1998 10:30	237
2/3/1999 10:30	148
5/3/1999 11:00	218
7/28/1999 11:30	266
9/21/1999 12:30	248
11/29/1999 12:00	191
1/18/2000 12:30	207
3/13/2000 15:00	211
5/8/2000 12:30	177
7/11/2001 9:15	238
9/26/2001 10:15	239
11/5/2001 9:00	266
1/8/2002 9:00	177
3/21/2002 11:05	172
5/22/2002 12:10	199
7/10/2002 10:00	255
11/20/2002 8:50	197
1/28/2003 12:30	248
4/1/2003 10:50	189

mean hardness 208 mg/L

\*5/29/2003 15.9 mg/L assumed data was a typo; did not use in calculation of mean

Also assumed 5.29/03 value of 368 mg/L could have also been equipment error - not used to calculate mean

Watershed Code VAW-N21R  
Station No. 9-MLC005.44 (Route 8 bridge - above Riner STP)

Collection Date Time	Temp Celsius
01/18/2000 12:30	3.4
03/13/2000 15:00	11.6
05/08/2000 12:30	18.6
07/11/2001 09:15	17.1
09/26/2001 10:15	10.8
11/05/2001 09:00	7.8
01/08/2002 09:00	0
03/21/2002 11:05	11.8
05/22/2002 12:10	13.8
06/06/2002 13:00	19.58
07/10/2002 10:00	18.05
11/20/2002 08:50	9.52
01/28/2003 12:30	6
04/01/2003 10:50	9.61
01/09/2007 13:55	8.2
03/22/2007 13:40	15.1
05/02/2007 10:45	15.2
07/18/2007 14:20	25.5
09/11/2007 12:25	19.8
11/01/2007 12:50	12.6
01/16/2008 11:00	1.4
03/20/2008 12:15	9
05/12/2008 13:00	11.7
05/22/2008 13:00	18
07/01/2008 13:10	18.5
09/16/2008 15:00	17.4
11/24/2008 14:10	2.3
01/29/2009 11:40	3.8
03/18/2009 10:55	11
05/19/2009 12:30	14.9
07/08/2009 13:20	18.6
09/17/2009 11:05	15.7
11/19/2009 12:00	13
01/12/2010 12:20	6.6
03/25/2010 11:50	10.6
05/11/2010 12:15	12
07/08/2010 14:05	23.5
09/14/2010 14:40	19.9
11/17/2010 12:35	10.9
01/25/2011 13:25	5.4
03/23/2011 10:55	12.6
05/25/2011 12:00	16.8
07/21/2011 12:40	21.6
09/13/2011 13:10	18.4
11/30/2011 12:25	9.6
01/19/2012 13:05	7.7
04/19/2012 12:40	12.9
06/07/2012 13:00	18.1
08/29/2012 13:15	21.3
10/31/2012 12:40	7.3

90th Percentile temperature 19.8 °C  
90th Percentile temperature 16.0 °C (January - May)

Watershed Code VAW-N21R  
Station No. 9-MLC005.44 (Route 8 bridge - above Riner STP)

Collection Date Time	pH (S.U.)
01/18/2000 12:30	8.3
03/13/2000 15:00	8
05/08/2000 12:30	8.7
07/11/2001 09:15	8.12
09/26/2001 10:15	8.2
11/05/2001 09:00	7.56
01/08/2002 09:00	8.29
03/21/2002 11:05	8.23
05/22/2002 12:10	8.04
06/06/2002 13:00	7.86
07/10/2002 10:00	7.61
11/20/2002 08:50	7.45
04/01/2003 10:50	7.8
01/09/2007 13:55	7.9
03/22/2007 13:40	8
05/02/2007 10:45	7.9
07/18/2007 14:20	8.1
09/11/2007 12:25	7.9
11/01/2007 12:50	7.8
01/16/2008 11:00	7.5
03/20/2008 12:15	7.5
05/12/2008 13:00	8.1
07/01/2008 13:10	7.9
09/16/2008 15:00	7.8
11/24/2008 14:10	7.7
01/29/2009 11:40	7.8
03/18/2009 10:55	7.2
05/19/2009 12:30	7.9
07/08/2009 13:20	7.9
09/17/2009 11:05	7.9
11/19/2009 12:00	7.7
01/12/2010 12:20	7.9
03/25/2010 11:50	8.1
05/11/2010 12:15	8
07/08/2010 14:05	8.2
09/14/2010 14:40	6.5
11/17/2010 12:35	8.3
01/25/2011 13:25	8.4
03/23/2011 10:55	8
05/25/2011 12:00	7.9
07/21/2011 12:40	8
09/13/2011 13:10	8.1
11/30/2011 12:25	7.8
01/19/2012 13:05	8.1
04/19/2012 12:40	8.1
06/07/2012 13:00	8.1
08/29/2012 13:15	8.2
10/31/2012 12:40	7.7

90th Percentile pH 8.2 S.U.  
10th Percentile pH 7.5 S.U.

(7) Dale Service Corp.-Section 8 WWTF: waste load allocations (WLAs) based on a design flow capacity of 4.6 million gallons per day (MGD). If plant is not certified to operate at 4.6 MGD design flow capacity by December 31, 2010, the WLAs will decrease to TN = 36,547 lbs/yr; TP = 2,193 lbs/yr, based on a design flow capacity of 4.0 MGD.

(8) Fauquier Co. W&SA-Vint Hill STP: waste load allocations (WLAs) based on a design flow capacity of 0.95 million gallons per day (MGD). If plant is not certified to operate at 0.95 MGD design flow capacity by December 31, 2010, the WLAs will decrease to TN = 5,482 lbs/yr; TP = 548 lbs/yr, based on a design flow capacity of 0.6 MGD.

(9) Parkins Mill STP: waste load allocations (WLAs) based on a design flow capacity of 5.0 million gallons per day (MGD). If plant is not certified to operate at 5.0 MGD design flow capacity by December 31, 2010, the WLAs will decrease to TN = 36,547 lbs/yr; TP = 2,741 lbs/yr, based on a design flow capacity of 3.0 MGD.

**9 VAC 25-720-130. New River Basin.**

**A. Total Maximum Daily Load (TMDLs).**

<b>TMDL #</b>	<b>Stream Name</b>	<b>TMDL Title</b>	<b>City/County</b>	<b>WBID</b>	<b>Pollutant</b>	<b>WLA</b>	<b>Units</b>
1.	Stroubles Creek	Benthic TMDL for Stroubles Creek in Montgomery County, Virginia	Montgomery	N22R	Sediment	233.15	T/YR
2.	Back Creek	Fecal Bacteria and General Standard Total Maximum Daily Load Development for Back Creek Watershed, Pulaski County, VA	Pulaski	N22R	Sediment	0.28	T/YR
3.	Crab Creek	Fecal Bacteria and General Standard Total Maximum Daily Load Development for Crab Creek Watershed, Montgomery County, VA	Montgomery	N18R	Sediment	77	T/YR
4.	Peak Creek	Fecal Bacteria and General Standard Total	Pulaski	N17R	Copper	12	KG/YR

		Maximum Daily Load Development for Peak Creek Watershed, Pulaski County, VA					
5.	Peak Creek	Fecal Bacteria and General Standard Total Maximum Daily Load Development for Peak Creek Watershed, Pulaski County, VA	Pulaski	N17R	Zinc	57	KG/YR
6.	Bluestone River	Fecal Bacteria and General Standard Total Maximum Daily Load Development for Bluestone River	Tazewell	N36R	Sediment	116.2	T/YR
7.	Hunting Camp Creek	"Total Maximum Daily Load (TMDL) Development for Hunting Camp Creek Aquatic Life Use (Benthic) and E. coli (Bacteria) Impairments"	Bland	N31R	Sediment	0	LB/YR
8.	Chestnut Creek	Total Maximum Daily Load Development for Chestnut Creek, Fecal Bacteria and General Standard (Benthic)	Carroll, Grayson	N06R	Sediment	18.9	T/YR

B. New River non-TMDL waste load allocations



New River non-TMDL waste load allocations

Water Body	Permit No	Facility Name	Outfall No.	Receiving Stream	River Mile	Parameter Description	WLA	Units WLA
VAS-N11R	VA0020281	Wytheville WWTP	001	Reed Creek	25.79	BOD5	360	KG/D
VAS-N15R	VA0089443	Hillsville WWTP	001	Little Reed Island Creed	25.12	CBOD5, JAN-MAY	118	KG/D
						CBOD5, JUN-DEC	95	KG/D
VAW-N21R	VA0024040	Montgomery Co. PSA - Riner Town - Sewage Treatment Plant	001	Mill Creek	5.12	BOD5	7.5	KG/D
						TKN (N-KJEL)	1.9	KG/D
VAW-N22R	VA0060844	Blacksburg VPI Sanitation Auth - Lower Stroubles Creek WWTP	001	New River	71.37	BOD5	818	KG/D
VAS-N36R	VA0025054	Bluefield Westside WWTP	001	Bluestone River	25.64	BOD5, JUN-NOV	130	KG/D
						BOD5, DEC-MAY	260	KG/D
VAS-N36R	VA0062561	Tazewell County PSA - Falls Mills Hales Bottom STP	001	Bluestone River	22.49	BOD5	5.5	KG/D
VAS-N37R	VA0029602	Pocahontas STP <sup>1</sup>	001	Laurel Fork	1.99	BOD5	17	KG/D
VAW-N21R	VA0024040	Montgomery Co. PSA - Riner Town - Sewage Treatment Plant	001	Mill Creek	5.12	BOD5	7.5	KG/D
						TKN (N-KJEL)	1.9	KG/D
VAW-N22R	VA0060844	Blacksburg VPI Sanitation Auth - Lower Stroubles Creek WWTP	001	New River	71.37	BOD5	818	KG/D
1. Pocahontas STP: Secondary treatment will be required until a further verification of the model is made to document the need for treatment beyond secondary								

Certified True and Accurate: \_\_\_\_\_

David K. Paylor, Director, DEQ

Date: \_\_\_\_\_



# 2010 Impaired Waters

## Categories 4 and 5 by DCR Watershed\*

### New River Basin

#### Fact Sheet prepared for DCR Watershed: N21\*

Cause Group Code: **N21R-03-BAC**

**Mill Creek, Poplar Branch, Mill Creek UTs (XDE & XDF)**

**Location:** The upper limit begins at the headwaters of Mill Creek on the Riner Quad and extends downstream to the Mill Creek confluence with Meadow Creek at the Rt. 600 Bridge on the Radford South Quad (7.04 miles). This impairment also includes Poplar Branch and its tributaries from its mouth on Mill Creek to its headwaters as well as to unnamed tributaries to Mill Creek (XDE & XDF).

**City / County:** Montgomery Co.

**Use(s):** Recreation

**Cause(s) /**

**VA Category:** Escherichia coli/ 4A

Fecal Coliform/ 4A

The Mill Creek Bacteria Total Maximum Daily Load (TMDL) is U.S. EPA approved on 6/05/2002 [Fed ID 9453 / 19986] and SWCB approved 6/17/2004 (formerly VAW-N21R-03). The Bacteria Implementation Plan (IP) received SWCB approval on 6/27/2007. The 1996 / 2002 / 2004 impaired waters now extend to the headwaters of Mill Creek (7.04 miles). 2002 tributary additions include Poplar Branch (4.57 miles) and two unnamed tributaries (XDE 1.72 miles and XDF 1.91 miles). The waters are impaired for a total of 15.25 miles.

The waters are originally 303(d) Listed based on the former fecal coliform (FC) WQS instantaneous criterion of 1000 cfu/100 ml and 200 geometric mean. The 2004 Integrated Report (IR) records exceedances of both the former FC 400 cfu/100 ml instantaneous criterion and geometric mean criterion of 200 cfu/100 ml. Listed below are the monitored sites showing fecal coliform instantaneous excursions / with total sample collections; (maximum) and geometric mean calculation exceedances / with total calculations where applicable. Instantaneous escherichia coli (E. coli) single observations from the 2008 Integrated Report are listed next (value). Each exceed the WQS instantaneous criterion of 235 cfu/100 ml. Escherichia coli (E.coli) replaces fecal coliform (FC) bacteria as the indicator as per Water Quality Standards [9 VAC 25-260-170. Bacteria; other waters].

Below are listed Escherichia coli (E.coli) data from the 2010 data window. No geometric mean data are available for assessment.

9-MLC005.44- Escherichia coli (E.coli) exceeds the 235 cfu/100 ml instantaneous criterion in four of 12 samples. The exceeding values range from 250 to 580 cfu/100 ml. DO, Temp, pH, NH3-N, nitrate and nitrite Fully Support.

9-MLC002.59 (Rt. 669 Bridge)- Seven of 12 E.coli samples exceed the 235 cfu/100 ml instantaneous criterion in 2010. Values in excess range from 580 to greater than 2000 cfu/100 ml.

9-MLC001.53 (Rt. 693, Childress)- 2010 E.coli excursions are found in three of 12 samples. Exceeding values range from 300 to 1100 cfu/100 ml.

Data below reflect the 2004, 2006 and 2008 IR data windows as there were no additional data beyond the 2006 IR in the 2008 assessment. Two ambient fixed sites 9-MLC005.44 and 9-MLC001.53 are included with the non-fixed sites below.

#### 2004 IR results:

##### Mill Creek

9-MLC000.17 (Rt. 600 Bridge) - 3/5; (3900); 1/1 geomean; E.coli- 1/1 (800).

9-MLC001.31 (Rt. 693 Bridge) - 3/5; (2300); 1/1 geomean; E.coli- 1/1 (800).

9-MLC001.53 (Rt. 693, Childress) - 3/6; (2300).

9-MLC002.74 (Private Road off Rt. 616) - 4/5; (>8000); 1/1 geomean; E.coli- 1/1 (800).

9-MLC005.44 (Rt. 8 Bridge-above Riner STP)- 18/25; (2500); E.coli- 1/1 (800).

9-MLC006.00 (Private road Rt. 616)- 2/5; (>8000); 0/1 geomean; E.coli- 1/1 (>800).

##### Poplar Branch

9-PPL000.01 (Private Road at mouth)- 1/1; (>8000).



# 2010 Impaired Waters

## Categories 4 and 5 by DCR Watershed\*

### New River Basin

#### Fact Sheet prepared for DCR Watershed: N21\*

9-PPL001.27 (Rt. 616 Bridge)- 2/2 (2800).

#### Mill Creek Unnamed Tributaries

9-XDE000.95 (Rt. 678 Bridge)- 4/5; (>8000); 1/1 geomean; E.coli- 1/1 (>800).

9-XDF000.11 (Private road Rt. 669)- 4/5;(2600); 1/1 geomean; E.coli- 1/1 (>800).

2006 IR results for 2006 stations within the data window:

#### Mill Creek

9-MLC005.44- 2006 FC exceeds the instantaneous criterion in 10 of 15 observations. Exceeding values range from 600 to 2000 cfu/100 ml. 2008 FC exceeds in eight of 11 samples.

9-MLC002.74- 2006 FC exceeds the WQS 400 cfu/100 ml instantaneous criterion in 10 of 12 observations. The maximum exceedance is greater than 8000 and the minimum is 500 cfu/100 ml. 2008 FC exceeds in nine of 11 observations.

9-MLC001.53- 2006 FC excursions are found in five of eight samples with a maximum of 2300 cfu/100 ml. 2008 five of eight FC samples exceed.

Assessment Unit / Water Name / Description	Cause Category / Name	Nested	Cycle First Listed	TMDL Schedule or EPA Approval	Size
VAW-N21R_MLC01A00 / Mill Creek / Mill Creek mainstem waters from its mouth on Meadow Creek upstream to the Montgomery County PSA Riner STP outfall.	4A Escherichia coli		2010	6/5/2002	4.95
VAW-N21R_MLC02A00 / Mill Creek / Mill Creek mainstem waters from the Montgomery County PSA Riner STP outfall upstream to its headwaters.	4A Escherichia coli		2010	6/5/2002	2.10

#### Mill Creek, Poplar Branch, Mill Creek UTs (XDE & XDF)

DCR Watershed: N21\*

Escherichia coli - Total Impaired Size by Water Type:

Estuary (Sq. Miles)      Reservoir (Acres)      River (Miles)

**7.05**

Assessment Unit / Water Name / Description	Cause Category / Name	Nested	Cycle First Listed	TMDL Schedule or EPA Approval	Size
VAW-N21R_PPL01A02 / Poplar Branch / Poplar Branch mainstem and tributaries from its confluence with Mill Creek upstream to its headwaters.	4A Fecal Coliform		2002	6/5/2002	4.57
VAW-N21R_XDE01A02 / Mill Creek, UT (XDE) / An unnamed tributary (XDE) to Mill Creek from its mouth upstream. The stream is located in the headwaters of Mill Creek flowing to VAW-N21R_MLC02A00.	4A Fecal Coliform		2002	6/5/2002	1.72
VAW-N21R_XDF01A02 / Mill Creek, UT (XDF) / An unnamed tributary (XDF) to Mill Creek from its mouth upstream. The stream is located in the headwaters of Mill Creek flowing to VAW-N21R_MLC01A00.	4A Fecal Coliform		2002	6/5/2002	1.91

#### Mill Creek, Poplar Branch, Mill Creek UTs (XDE & XDF)

DCR Watershed: N21\*

Fecal Coliform - Total Impaired Size by Water Type:

Estuary (Sq. Miles)      Reservoir (Acres)      River (Miles)

**8.20**



# 2010 Impaired Waters

## Categories 4 and 5 by DCR Watershed\*

---

### New River Basin

**Fact Sheet prepared for DCR Watershed: N21\***

**Sources:**

Livestock (Grazing or  
Feeding Operations)

On-site Treatment Systems  
(Septic Systems and Similar  
Decentralized Systems)

Unspecified Domestic  
Waste

Wet Weather Discharges  
(Non-Point Source)

Wildlife Other than  
Waterfowl

\*Header Information: Location, City/County, Cause/VA Category and Narratives; describe the entire extent of the Impairment. Sizes presented are for Assessment Units (AUs) lying within the DCR Watershed boundary noted above.

# **Fecal Coliform TMDL for Mill Creek Watershed, Virginia**

Submitted by

*Virginia Department of Environmental Quality*

*Virginia Department of Conservation and Recreation*

Prepared by



THE Louis Berger Group, INC.

1819 H Street, NW, Suite 900  
Washington, DC 20006

June 2002



### 3.5 Fecal Coliform Sources Assessment

This section will focus on characterizing the fecal coliform sources in the watershed that potentially contribute to the fecal coliform loading to Mill Creek. These sources include permitted facilities, sanitary sewer systems and septic systems, livestock, land application of manure and biosolids wildlife, and pets. Section 4 will include a detailed presentation of how these sources are incorporated and represented in the model.

#### 3.5.1 Permitted Facilities

There is only one permitted facility located in the Mill Creek watershed based on data and information obtained from DEQ's West Central Regional Office. The Riner Sewage Treatment Plant (STP) permit number, design flow, and status are presented in Table 3-9. The location of the plant is presented in Figure 3-4.

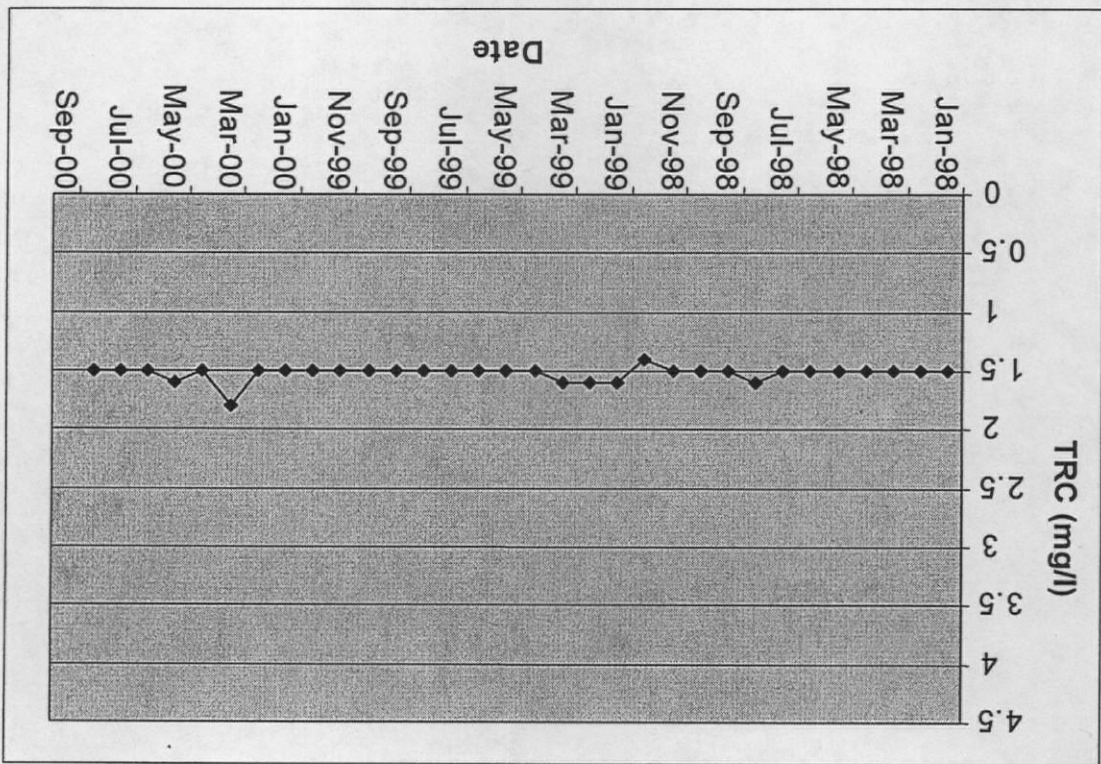
**Table 3-9: Permitted Discharge in the Mill Creek Watershed**

Permit Number	Facility Name	Design Flow (gpd) <sup>1</sup>	Status
VA0024040	Riner STP	100,000	Active

1. gpd: gallons per day

The Riner STP switched from using chlorine to ultraviolet for disinfection in September 2000. Prior to this switch, the Riner STP reported the residual chlorine concentration levels; these are presented in Figure 3-7. Chlorine concentration data for the period from January 1998 to August 2000 indicate that total residual chlorine (TRC) concentrations ranged from 1.4 to 1.8 mg/l. This indicates that adequate disinfection was achieved at the plant.

Figure 3-7: Riner STP TRC Concentration



Fecal coliform concentration data were available for the period from September 2000 to October 2001. Figure 3-8 shows the variation of the fecal coliform concentration in the plant effluent. The fecal coliform concentrations ranged from 0 to 16,000 most probable number (MPN). Although the daily values exceeded the 1,000 cfu/100 ml standard on seven occasions, no permit limit violation occurred during this reporting period based on the geometric mean standard of 200 cfu/100ml. For the Mill Creek TMDL development,



Figure 5-1: Existing and Allocated Fecal Coliform Loadings

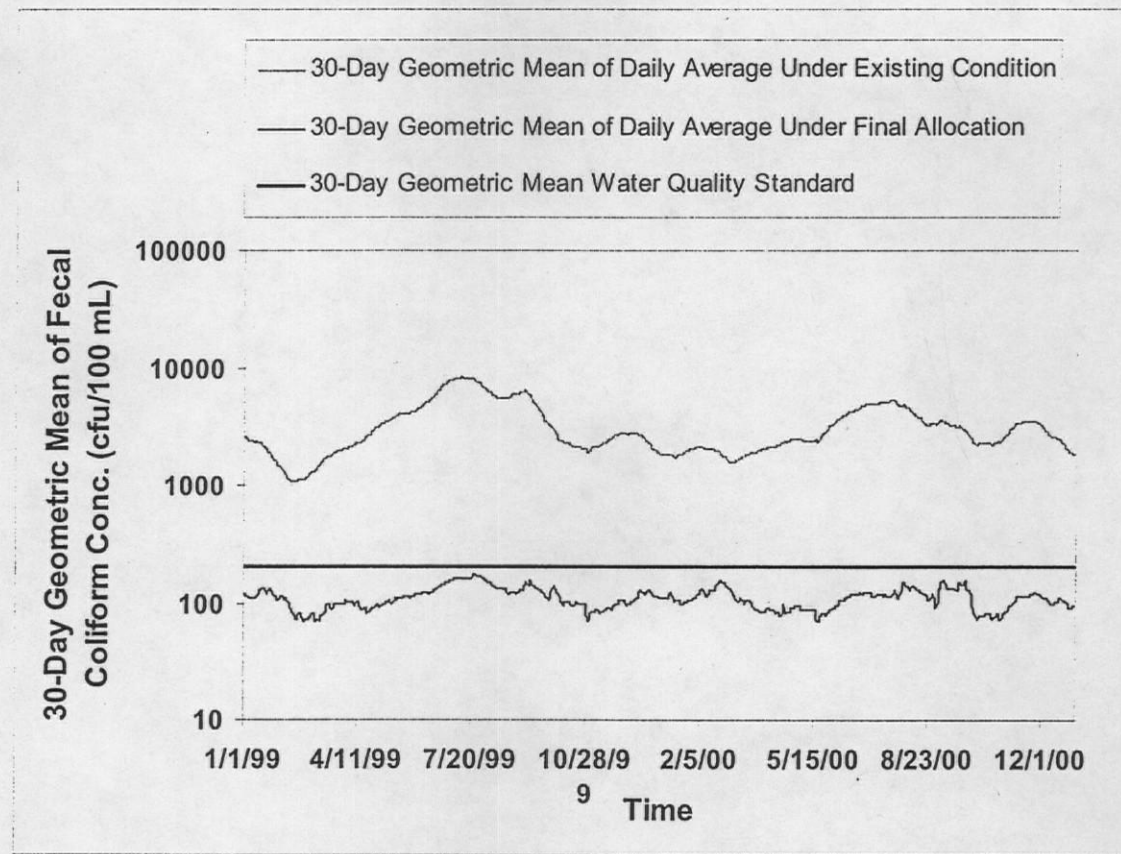


Table 5-5: Mill Creek TMDL Allocation Plan Loads (cfu/year)

Point Sources (WLA)	Nonpoint sources (LA)	Margin of safety (MOS)	TMDL
2.62E+11	4.18E+14	2.32E+12	4.22E+14



standards are still not being attained after the implementation of Phases 1 and 2, further work and reductions will be warranted.

Mill Creek identified as watershed VAW-N21R, was given a high priority for TMDL development. Section 303(d) of the CWA and its implementing regulations require a TMDL to be developed for those waterbodies identified as impaired by the state where technology-based and other controls do not provide for the attainment of water quality standards. The TMDL submitted by Virginia is designed to determine the acceptable load of fecal coliform which can be delivered to Mill Creek, as demonstrated by the Hydrologic Simulation Program Fortran (HSPF)<sup>1</sup>, in order to ensure that the water quality standard is attained and maintained. HSPF is considered an appropriate model to analyze this watershed because of its dynamic ability to simulate both watershed loading and receiving water quality over a wide range of conditions.

The TMDL analysis allocates the application/deposition of fecal coliform to land based and instream sources. For land based sources, the HSPF model accounts for the buildup and washoff of pollutants from these areas. Buildup (accumulation) refers to all of the complex spectrum of dry-weather processes that deposit or remove (die-off) pollutants between storms.<sup>2</sup> Washoff is the removal of fecal coliform which occurs as a result of runoff associated with storm events. These two processes allow the HSPF model to determine the amount of fecal coliform from land based sources which is reaching the stream. Point sources and wastes deposited directly to the stream were treated as direct deposits. These wastes do not need a transport mechanism to allow them to reach the stream. The allocation plan calls for the reduction in fecal coliform wastes delivered by cattle in-stream, wildlife in-stream, straight pipes, failing septic systems, and specific land uses.

Table 1 - Summarizes the Specific Elements of the TMDL.

Segment	Parameter	TMDL	WLA (cfu/yr)	LA (cfu/yr)	MOS (cfu/yr)
Total	Fecal Coliform	4.00E+14	2.62E+11	3.98E+14	2.32E+12

<sup>1</sup> Virginia includes an explicit MOS by identifying the TMDL target as achieving the total fecal coliform water quality concentration of 190 cfu/100ml as opposed to the WQS of 200 cfu/ml. This can be viewed explicitly as a 5% MOS.

EPA believes it is important to recognize the conceptual difference among the waste load allocation (WLA) values, load allocation (LA) values for sources modeled as direct deposition to stream segments, and LA values for flux sources of fecal coliform to land use categories. The WLA

<sup>1</sup>Bicknell, B.R., J.C. Imhoff, J.L. Little, and R.C. Johanson. 1993. Hydrologic Simulation Program-FORTRAN (HSPF): User's Manual for release 10.0. EPA 600/3-84-066. U.S. Environmental Protection Agency, Environmental Research Laboratory, Athens, GA.

<sup>2</sup>CH2MHILL, 2000. Fecal Coliform TMDL Development for Cedar, Hall, Byers, and Hutton Creeks Virginia,

Virginia indicates that the total allowable loading of fecal coliform is the sum of the loads allocated to land based precipitation driven nonpoint source areas (forest and agricultural land segments), directly deposited nonpoint sources of fecal coliform (cattle in-stream, wildlife in-stream, and straight pipes), and point sources. Activities such as the application of manure and the direct deposition of wastes from grazing animals are considered fluxes to the land use categories. The actual value for the total fecal load can be found in Table 1 of this document. The total allowable load is calculated on an annual basis due to the nature of HSPF model.

#### Waste Load Allocations

Virginia has stated that there is one point source, Riner Sewage Treatment Plant (STP), on Mill Creek. This facility is allowed to discharge fecal coliform at a concentration of 200 cfu/100 mL. The STP has a design flow of 0.1 million gallons per day (mgd). The facility was given a WLA of 2.62E+11. The WLA was determined by multiplying the facility's allowable concentration (200 cfu/100 mL) by their permitted flow by the number of days in a year (365). It should be noted that the facility is often discharging fecal coliform at concentrations far lower than its permitted value. Therefore, the WLA may be over estimating the loading for this facility which would provide for an additional wildlife load.

EPA regulations require that an approvable TMDL include individual WLAs for each point source. According to 40 CFR 122.44(d)(1)(vii)(B), "Effluent limits developed to protect a narrative water quality criterion, a numeric water quality criterion, or both, are consistent with assumptions and requirements of any available WLA for the discharge prepared by the state and approved by EPA pursuant to 40 CFR 130.7." Furthermore, EPA has authority to object to the issuance of any National Pollutant Discharge Elimination System (NPDES) permit that is inconsistent with the WLAs established for that point source.

- Table 2 - Waste Load Allocations for Mill Creek

Facility	Permit Number	Existing Load	Allocated Load
Riner STP	VA0024040	2.62E+11	2.62E+11
Total	N/A	2.62E+11	2.62E+11

#### Load Allocations

According to Federal regulations at 40 CFR 130.2(g), LAs are best estimates of the loading, which may range from reasonably accurate estimates to gross allotments, depending on the availability of data and appropriate techniques for predicting loading. Wherever possible, natural and nonpoint

## **Attachment F**

### **Effluent Data**



PCA Order No.: 418676  
Client: Montgomery County Public Service Authority  
Project: Riner STP

# Final Report

Report Date: 4/18/2008

Sample Number: 418676-01

Date Collected: 4/9/2008

Time Collected: 10:00

Description: Plant Outfall 001

Matrix: Wastewater

Sample Type: Grab

<u>Analysis</u>	<u>Result</u>	<u>Reporting Limit</u>	<u>Units</u>	<u>Date Analyzed</u>	<u>Time Analyzed</u>	<u>Analyst</u>	<u>Method</u>
Copper, Dissolved	0.012	0.005	mg/L	4/15/2008	09:00	CDM	EPA 200.7
Silver, Dissolved	< 0.002	0.002	mg/L	4/15/2008	09:00	CDM	EPA 200.7

RECEIVED

MAY 09 2008

DEQ-WCRO



Olver Laboratories Incorporated • Environmental Scientists and Consultants  
1116 South Main Street, Suite 200 • Blacksburg, Virginia 24060  
(540) 552-6974 • Fax: (540) 552-1715

Report No.: 17667  
Report Date: 4/14/03  
Client: Montgomery County Public Service Authority

Date Received: 3/18/03 and 3/19/03

Sample Number: 155962  
Date Collected: 3/18/03  
Time Collected: 8:30 AM  
Description: Outfall 001  
Wastewater Grab

RECEIVED

MAY 12 2003

DEQ-WORO

Analysis	Result	QL*	SSTV	Units	Date/Time Analyzed	Analyst
Total Cyanide (EPA 335.2)	BQL	10.0	N/A	µg/L	3/19/03; 0815	kblevins
Dissolved Hexavalent Chromium (SM 3500Cr,D)	BQL	2	2	µg/L	3/18/03; 1420	mferguson
Dissolved Arsenic (EPA 200.9)	BQL	10	10	µg/L	3/26/03; 1230	tstiess
Dissolved Barium (EPA 200.7)	14	2	400	µg/L	4/01/03; 1530	mplott
Dissolved Cadmium (EPA 200.9)	BQL	0.1	0.5	µg/L	3/26/03; 1100	tstiess
Dissolved Chromium III (EPA 200.7)	BQL	1	150	µg/L	4/01/03; 1530	mplott
Dissolved Copper (EPA 200.7)	BQL	10	10	µg/L	4/01/03; 1530	mplott
Dissolved Iron (EPA 200.7)	BQL	50	50	µg/L	4/01/03; 1530	mplott
Dissolved Lead (EPA 200.9)	BQL	1	2	µg/L	3/27/03; 1100	tstiess
Dissolved Manganese (EPA 200.7)	9	5	10	µg/L	4/01/03; 1530	mplott
Dissolved Mercury (EPA 163.1)	BQL	0.01	0.01	µg/L	4/04/03; N.A.	scontra
Dissolved Nickel (EPA 200.7)	BQL	3	10	µg/L	4/01/03; 1530	mplott
Dissolved Selenium (EPA 200.9)	BQL	1	2	µg/L	3/27/03; 0900	tstiess
Dissolved Silver (EPA 200.7)	3	1	5	µg/L	4/03/03; 0930	mplott
Dissolved Zinc (EPA 200.7)	66	40	50	µg/L	4/01/03; 1530	mplott

\* Quantitation Limit as depicted in VA Permit No. VA0024040. Where not specified, the QL is based on the MDL.



Oliver Laboratories Incorporated • Environmental Scientists and Consultants  
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(540) 552-6974 • Fax: (540) 552-1715

Report No.: 17667  
Report Date: 4/14/03  
Client: Montgomery County Public Service Authority

Date Received: 3/18/03 and 3/19/03

Sample Number: 155962  
Date Collected: 3/18/03  
Time Collected: 8:30 AM  
Description: Outfall 001  
Wastewater Grab

RECEIVED

MAY 12 2003

DEG-WORO

Analysis	Result	QL*	Units	Date/Time Analyzed	Analyst
Pesticides (EPA 608):				3/25/03; 1759	pwilliams
Aldrin	BQL	0.05	µg/L		
Chlordane	BQL	0.2	µg/L		
4,4'DDT	BQL	0.1	µg/L		
Arochlor-1016	BQL	1.0	µg/L		
Arochlor-1221	BQL	1.0	µg/L		
Arochlor-1232	BQL	1.0	µg/L		
Arochlor-1242	BQL	1.0	µg/L		
Arochlor-1248	BQL	1.0	µg/L		
Arochlor-1254	BQL	1.0	µg/L		
Arochlor-1260	BQL	1.0	µg/L		
Dieldrin	BQL	0.1	µg/L		
Endosulfan I	BQL	0.1	µg/L		
Endosulfan II	BQL	0.1	µg/L		
Endosulfan sulfate	BQL	0.1	µg/L		
Endrin	BQL	0.1	µg/L		
gamma-BHC (Lindane)	BQL	0.05	µg/L		
Heptachlor	BQL	0.05	µg/L		
Methoxychlor	BQL	0.2	µg/L		
Mirex	BQL	0.2	µg/L		
Toxaphene	BQL	5.0	µg/L		

\* Quantitation Limit as depicted in VA Permit No. VA0024040. Where not specified, the QL is based on the MDL.



Oliver Laboratories Incorporated • Environmental Scientists and Consultants  
1116 South Main Street, Suite 200 • Blacksburg, Virginia 24060  
(540) 552-6974 • Fax: (540) 552-1715

Report No.: 17667  
Report Date: 4/14/03  
Client: Montgomery County Public Service Authority

Date Received: 3/18/03 and 3/19/03

Sample Number: 155962  
Date Collected: 3/18/03  
Time Collected: 8:30 AM  
Description: Outfall 001  
Wastewater Grab

RECEIVED

NO 12 2003

DEC 11/03

Analysis	Result	QL*	Units	Date/Time Analyzed	Analyst
Pesticides (EPA 622 mod.):				3/27/03; 1628	dfaircloth
Chlorpyrifos	BQL	0.5	µg/L		
Demeton	BQL	0.5	µg/L		
Guthion	BQL	0.5	µg/L		
Malathion	BQL	0.5	µg/L		
Parathion	BQL	0.5	µg/L		
Herbicides (SW-846 8151A):				3/31/03; 1405	dfaircloth
2,4-D	BQL	2.0	µg/L		
Silvex	BQL	0.75	µg/L		
Base Neutral Extractables (EPA 625):				3/20/03; 1414	pwilliams
1,2-Dichlorobenzene	BQL	10.0	µg/L		
1,3-Dichlorobenzene	BQL	10.0	µg/L		
1,4-Dichlorobenzene	BQL	10.0	µg/L		
2,4-Dinitrotoluene	BQL	10.0	µg/L		
Anthracene	BQL	10.0	µg/L		
Benzo(a)anthracene	BQL	10.0	µg/L		
Benzo(a)pyrene	BQL	10.0	µg/L		
Benzo(b)fluoranthene	BQL	10.0	µg/L		
Benzo(k)fluoranthene	BQL	10.0	µg/L		
Bis(2-ethylhexyl)phthalate	BQL	10.0	µg/L		
Chrysene	BQL	10.0	µg/L		
Dibenzo(a,h)anthracene	BQL	20.0	µg/L		
Fluoranthene	BQL	10.0	µg/L		
Fluorene	BQL	10.0	µg/L		
Indeno(1,2,3-cd)pyrene	BQL	20.0	µg/L		

\* Quantitation Limit as depicted in VA Permit No. VA0024040. Where not specified, the QL is based on the MDL.



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Report No.: 17667  
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Client: Montgomery County Public Service Authority

Date Received: 3/18/03 and 3/19/03

Sample Number: 155962  
Date Collected: 3/18/03  
Time Collected: 8:30 AM  
Description: Outfall 001  
Wastewater Grab

MAY 12 2003

DEL-VICORO

Analysis	Result	QL*	Units	Date/Time Analyzed	Analyst
Base Neutral Extractables (EPA 625) (continued):				3/20/03; 1414	pwilliams
Isophorone	BQL	10.0	µg/L		
Naphthalene	BQL	10.0	µg/L		
Pyrene	BQL	10.0	µg/L		
Acid Extractables (EPA 625):				3/20/03; 1414	pwilliams
2,4,6-Trichlorophenol	BQL	10.0	µg/L		
Pentachlorophenol	BQL	50.0	µg/L		
Phenol	BQL	10.0	µg/L		
Volatile Organic Compounds (EPA 624):				3/20/03; 1203	bpukanecz
Benzene	BQL	10.0	µg/L		
Bromoform	BQL	10.0	µg/L		
Carbon Tetrachloride	BQL	10.0	µg/L		
Chlorodibromomethane	BQL	10.0	µg/L		
Chloroform	BQL	10.0	µg/L		
Chloromethane	BQL	20.0	µg/L		
Dichloromethane	BQL	20.0	µg/L		
Dichlorobromomethane	BQL	10.0	µg/L		
1,2-Dichloroethane	BQL	10.0	µg/L		
Ethylbenzene	BQL	10.0	µg/L		
Monochlorobenzene	BQL	50.0	µg/L		
Tetrachloroethylene	BQL	10.0	µg/L		
Toluene	BQL	10.0	µg/L		
Trichloroethylene	BQL	10.0	µg/L		
Vinyl Chloride	BQL	10.0	µg/L		
Xylenes (SW-846 8021B)	BQL	1.0	µg/L	3/25/03; 1201	bpukanecz

\* Quantitation Limit as depicted in VA Permit No. VA0024040. Where not specified, the QL is based on the MDL.





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Report No.: 17667  
Report Date: 4/14/03  
Client: Montgomery County Public Service Authority

Date Received: 3/18/03 and 3/19/03

Sample Number: 156004  
Date Collected: 3/18/03 - 3/19/03  
Time Collected: 7:00 AM - 7:00 AM  
Description: Outfall 001  
Wastewater Composite

RECEIVED

MAY 12 2003

DELIVERED

<u>Analysis</u>	<u>Result</u>	<u>QL*</u>	<u>SSTV</u>	<u>Units</u>	<u>Date/Time Analyzed</u>	<u>Analyst</u>
Sulfate (EPA 300.0)	204,000	100,000**	N/A	µg/L	3/20/03; 1320	kblevins

\* Quantitation Limit as depicted in VA Permit No. VA0024040. Where not specified, the QL is based on the MDL.

\*\* Sample required dilution; QL was raised accordingly.

Riner WWTP  
 VPDES Permit No. VA0024040  
 (Outfall 001)

Date Due	Flow (MGD)	TKN (mg/L)		cBOD <sub>5</sub> (mg/L)		DO (mg/L)	E. coli (N/CML)	TSS (mg/L)	
	Average	Average	Maximum	Average	Maximum	Minimum	Average	Average	Maximum
Limits	0.025	5.0	7.5	19	28	7	126	30	45
10-Nov-08	0.025	2	2.3	2	<QL	8.3	16	10	14
10-Dec-08	0.02	2.3	3.1	<QL	<QL	8.8	17	5	9
10-Jan-09	0.021	1.1	1.3	1	<QL	9.6	6	6	6
10-Feb-09	0.021	1.5	2.4	<QL	<QL	10.2	15	4	6
10-Mar-09	0.02	1.2	2.2	<QL	<QL	9	20	4	5
10-Apr-09	0.03	3.3	5.9	4	7	8.7	21	6	9
10-May-09	0.024	1.6	2	<QL	<QL	8.9	2	4	5
10-Jun-09	0.032	2.1	3.6	<QL	<QL	7.9	0	5	8
10-Jul-09	0.03	1.9	3.4	<QL	<QL	7.5	<QL	3	3
10-Aug-09	0.029	2.1	2.5	<QL	<QL	7.7	<QL	5	6
10-Sep-09	0.026	1.9	2.7	<QL	<QL	7.8	3	3	4
10-Oct-09	0.028	1.7	2.1	<QL	<QL	8	15	4	5
10-Nov-09	0.027	2.2	2.5	2	8	8.5	2.8	3	5
10-Dec-09	0.034	2.3	2.9	<QL	<QL	8.5	13	5	6
10-Jan-10	0.034	2.4	2.7	9	11	9.7	25	9	11
10-Feb-10	0.028	2.7	5.4	13	21	9.6	2	11	14
10-Mar-10	0.021	2	2.8	10	11	10.2	1	7	10
10-Apr-10	0.025	2.8	3	10	8	9.6	1	8	9
10-May-10	0.023	2.6	5.4	<QL	14	8.8	<1	4	5
10-Jun-10	0.026	1.8	2.5	<QL	<QL	8.7	5	2	4
10-Jul-10	0.017	1.6	2.1	<QL	<QL	7.5	<1.0	3	4
10-Aug-10	0.019	3	3.8	<QL	<QL	7.5	2	4	7
10-Sep-10	0.022	<QL	<QL	<QL	<QL	7.6	<1.0	2	2
10-Oct-10	0.025	2	2.3	<QL	<QL	7.7	<1.0	2	3
10-Nov-10	0.024	0.9	3.6	<QL	8	8.1	2	4	5
10-Dec-10	0.024	2.1	2.4	8	10	9.1	<1.0	6	8
10-Jan-11	0.023	4.6	6.4	17	30	10	4	38	103
10-Feb-11	0.02	4.2	8.3	18	20	10.6	7	12	18
10-Mar-11	0.024	4.9	11.6	16	27	10	20	15	19
10-Apr-11	0.031	5.6	11.6	17	24	8.5	4	11	14
10-May-11	0.026	2.3	4.7	5	9	8.2	5	5	5
10-Jun-11	0.03	1.4	1.8	<QL	<QL	8.4	2	3	3
10-Jul-11	0.023	1	1	<QL	<QL	8	6	2	6
10-Aug-11	0.018	<QL	<QL	<QL	<QL	7.6	2	3.2	12.7
10-Sep-11	0.017	2.1	3	5	5	7.5	4.7	7.4	16
10-Oct-11	0.02	<QL	<QL	<QL	<QL	7.8	7	4.7	6.3
10-Nov-11	0.019	<QL	<QL	6	8	8.2	8	6	12
10-Dec-11	0.018	1.5	1.5	6	18	9	4	6	7
10-Jan-12	0.021	<QL	<QL	<QL	<QL	9.5	4	4	5
10-Feb-12	0.023	1.5	1.5	10	12	10.5	20	7	16
10-Mar-12	0.022	2.2	2.4	8	8	10	3	4	6
10-Apr-12	0.022	3	5	8	18	8.8	5	4	4
10-May-12	0.019	4	6	<QL	<QL	8.6	4	4	4
10-Jun-12	0.019	2	2	<QL	<QL	8	2	30	4
10-Jul-12	0.016	<QL	<QL	<QL	<QL	8	3	2	3
10-Aug-12	0.014	<QL	<QL	<QL	<QL	7.2	2	3	3
10-Sep-12	0.026	<QL	<QL	<QL	<QL	7.5	2	3	4
10-Oct-12	0.03	1.1	1.1	<QL	<QL	7.6	7	3	9

Riner WWTP  
VPDES Permit No. VA0024040

Effluent Temperature

Date Due	°C
10-Nov-08	18.5
10-Dec-08	14.5
10-Jan-09	13
10-Feb-09	8.5
10-Mar-09	9
10-Apr-09	12.5
10-May-09	17
10-Jun-09	20.5
10-Jul-09	24
10-Aug-09	24
10-Sep-09	24.5
10-Oct-09	23
10-Nov-09	20
10-Dec-09	15
10-Jan-10	10.5
10-Feb-10	7
10-Mar-10	6
10-Apr-10	11
10-May-10	16
10-Jun-10	22
10-Jul-10	25
10-Aug-10	26
10-Sep-10	26
10-Oct-10	23
10-Nov-10	19
10-Dec-10	15.5
10-Jan-11	10.5
10-Feb-11	>0
10-Mar-11	11
10-Apr-11	13
10-May-11	18
10-Jun-11	23
10-Jul-11	23.7
10-Aug-11	28.8
10-Sep-11	25.9
10-Oct-11	24
10-Nov-11	18.5
10-Dec-11	15.7
10-Jan-12	12.5
10-Feb-12	10.5
10-Mar-12	11.5
10-Apr-12	21.9
10-May-12	20
10-Jun-12	23
10-Jul-12	26
10-Aug-12	27
10-Sep-12	25
10-Oct-12	25

90th Percentile Temp 25.9 °C  
90th Percentile temp 18.4 °C (Jan. - May)

10-Feb-11 >0 indeterminate (value not used)

Riner WWTP  
VPDES Permit No. VA0024040

**Effluent pH Data for 90th Percentile Calculation**

Days	Oct-11	Nov-11	Dec-11	Jan-12	Feb-12	Mar-12	Apr-12	May-12	Jun-12	Jul-12	Aug-12	Sep-12
1	7.55	7.42	7.11	7.36	7.53	7.33	7.49	7.30	7.34	7.51	7.44	7.73
2	7.50	7.11	7.04	7.22	7.12	7.70	7.37	7.37	7.45	7.48	7.30	7.72
3	7.19	7.47	7.37	7.10	7.26	7.30	7.62	7.40	7.30	7.30	7.31	7.82
4	7.41	7.30	7.45	6.88	7.60	7.42	7.42	7.60	7.26	7.26	7.57	7.26
5	7.20	7.11	7.08	7.14	7.67	7.36	7.61	7.51	7.31	7.17	7.53	7.08
6	7.50	7.37	7.54	7.24	7.40	7.45	7.53	7.44	7.15	8.03	7.40	7.33
7	7.41	7.27	7.30	7.18	7.60	7.65	7.29	7.55	7.20	7.17	7.17	8.00
8	7.37	7.31	7.24	7.47	7.17	7.44	7.55	7.21	7.14	7.42	7.39	7.97
9	7.27	7.12	7.61	7.32	7.48	7.34	7.51	7.58	7.20	7.70	7.44	7.81
10	7.31	7.05	7.47	6.93	7.30	7.35	7.23	7.42	7.53	7.63	7.57	7.60
11	7.37	7.16	7.37	7.31	7.42	7.30	7.15	7.34	7.47	7.50	7.83	7.17
12	7.57	7.55	7.40	7.34	7.36	7.35	7.25	7.36	7.10	7.75	7.46	7.47
13	7.40	7.42	7.25	7.23	7.28	7.36	6.92	7.53	7.07	7.15	7.25	7.70
14	7.54	7.57	7.20	7.12	7.22	7.46	7.00	7.51	7.09	7.60	7.57	7.43
15	7.36	7.30	7.17	7.06	7.41	7.34	7.11	7.22	7.60	7.45	7.25	7.47
16	7.30	7.42	7.23	7.11	7.34	7.38	7.30	7.04	7.48	7.21	7.41	7.70
17	7.08	7.32	7.10	7.48	7.36	7.50	7.16	7.14	7.41	7.11	7.40	7.31
18	7.17	7.21	7.21	7.31	7.30	7.25	7.21	7.46	7.60	7.80	7.19	7.40
19	7.46	7.48	7.34	7.52	7.62	7.06	7.18	7.31	7.63	7.32	7.13	7.34
20	7.53	7.35	7.50	7.15	7.35	6.75	7.16	7.22	7.42	7.18	7.50	7.16
21	7.32	7.30	7.20	7.15	7.48	7.50	7.53	7.50	7.58	7.45	7.22	7.34
22	7.27	7.16	7.27	7.21	7.25	7.55	7.60	7.71	7.69	7.69	7.12	7.56
23	7.47	7.19	7.01	7.35	7.78	7.55	7.56	7.28	7.42	7.59	7.06	7.59
24	7.27	7.34	7.30	6.86	7.00	7.40	7.41	7.50	7.70	7.34	7.10	7.41
25	7.10	7.36	7.42	7.31	7.19	7.20	7.18	7.45	7.61	7.60	7.70	7.94
26	7.30	7.30	7.11	7.25	7.31	7.57	7.13	7.37	7.44	7.25	7.57	7.30
27	7.40	7.50	7.69	7.33	7.06	7.50	7.19	7.33	7.56	7.54	7.29	7.95
28	7.23	6.95	7.19	7.70	7.36	7.15	6.98	7.79	7.46	7.24	7.06	7.44
29	7.09	7.18	7.09	7.40	7.30	7.23	7.13	7.51	7.09	7.22	7.16	7.54
30	7.29	7.37	7.32	7.12	7.31	7.70	6.96	7.48	7.58	7.30	7.10	7.47
31	7.29		7.42	7.21		7.40		7.41		7.52	7.27	

90th percentile pH    7.60   S.U.  
10th percentile pH    7.11   S.U.

**EMS, Inc.**  
**Environmental Management Services**  
Laboratory Services - Plant Operations - Consultants  
P.O. Box 784 Wytheville, VA 24382  
Phone (276) 228-6464 Fax (276) 228-2325  
E-mail: emslab@wiredog.com

Sample No.: 08-1984

Report Date: 08-13-08

**CHAIN OF CUSTODY INFORMATION**

Client: Montgomery County PSA

Attention: Bob Fronk / Bruce Jones

Sample Source: Riner WWTP Outfall 001

Description: Effluent

Date/Time Collected: 08-11-08/0810

Collected By: Bruce Jones

Delivered To Laboratory By: Bruce Jones

Received By: Gary M. Johnson

Date/Time Received At Laboratory: 08-11-08/1030

Preservation: Cold, HNO<sub>3</sub>

**ANALYTICAL DATA**

Parameter	Result	Method	Date/Time Analyzed	Analyst
Copper, ug/L	25.4	EPA 200.8	08-12-08/1814	SC*
Zinc, ug/L	88.4	EPA 200.8	08-12-08/1814	SC*

Analysis Subcontracted

total recoverable

By

  
Gary M. Johnson

**EMS, Inc.**  
**Environmental Management Services**  
Laboratory Services - Plant Operations - Consultants  
P.O. Box 784 Wytheville, VA 24382  
Phone (276) 228-6464 Fax (276) 228-2325  
E-mail: emslab@wiredog.com

Sample No.: 08-1984

Report Date: 08-13-08

**CHAIN OF CUSTODY INFORMATION**

Client: Montgomery County PSA

Attention: Bob Frank / Bruce Jones

Sample Source: Riner WWTP Outfall 001

Description: Effluent

Date/Time Collected: 08-11-08/0810

Collected By: Bruce Jones

Delivered To Laboratory By: Bruce Jones

Received By: Gary M. Johnson

Date/Time Received At Laboratory: 08-11-08/1030

Preservation: Cold, HNO<sub>3</sub>

**ANALYTICAL DATA**

Parameter	Result	Method	Date/Time Analyzed	Analyst
Copper, ug/L	25.4	EPA 200.8	08-12-08/1814	SC*
Zinc, ug/L	88.4	EPA 200.8	08-12-08/1814	SC*

Analysis Subcontracted

total recoverable

By

  
Gary M. Johnson

DEQ LAB I.D. NO. 000110

DCLS LAB I.D. NO. 00102

US EPA LAB CODE I.D. VA01164

Riner WWTP  
VA0024040

**Effluent Dissolved Copper**

Date	µg/L
4/18/2008	12

**Effluent Dissolved Silver**

Date	µg/L
4/9/2008	<0.002

**Effluent Dissolved Zinc**

Date	µg/L
9/26/2006	173
9/26/2006	232
12/5/2006	113
3/6/2007	103
6/5/2007	141
9/11/2007	75
12/11/2007	109
3/4/2008	101

Riner WWTP  
VA0024040

Date	TKN mg/L	ammonia mg/L
limits	(Jan. - May) 5.1 mg/L monthly ave., 7.6 mg/L max weekly	(June-Dec.) 1.8 mg/l monthly ave. 2.6 mg/L max weekly
9/8/2010	1.6	
9/14/2010	2.3	<0.10
9/22/2010	<1.0	
9/28/2010	<1.0	
10/4/2010	<1.0	
10/12/2010	<1.0	<0.10
10/19/2010	3.6	
10/26/2010	<1.0	
11/2/2010	<1.0	
11/9/2010	1.7	<0.10
11/23/2010	<1.0	
11/16/110	2.4	
12/14/2010	6.4	<0.10
12/21/2010	2.8	
12/28/2010	<1.0	
1/4/2011	1.6	
1/11/2011	<1.0	0.22
1/18/2011	2.7	
1/25/2011	8.3	
2/1/2011	1.9	
2/8/2011	11.6	
2/16/2011	3.2	
2/22/2011	2.9	<0.10
3/1/2011	7.4	
3/9/2011	2.3	<0.10
3/16/2011	4.7	
3/22/2011	11.6	
3/29/2011	3.8	
4/12/2011	1.9	
4/19/2011	1.1	
4/26/2011	1.3	
5/3/2011	1.3	
5/10/2011	1.8	
5/17/2011	1.7	
5/24/2011	1.1	
5/31/2011	0.9	
6/7/2011	0.7	
6/14/2011	<0.5	
6/21/2011	<1.00	
6/28/2011	<1.00	
7/5/2011	<1.00	
7/12/2011	<1.00	
7/19/2011	<1.00	
7/26/2011	<1.00	
8/2/2011	<1.00	
8/9/2011	1.06	
8/16/2011	<1.00	
8/23/2011	3.05	
8/30/2011	<1.00	
9/6/2011	<1.00	0.15



Riner WWTP  
VA0024040

	TKN	ammonia
Date	mg/L	mg/L
limits	(Jan. - May) 5.1 mg/L monthly ave., 7.6 mg/L max weekly	(June-Dec.) 1.8 mg/l monthly ave. 2.6 mg/L max weekly
9/13/2011	<1.00	
10/4/2011	<1.00	<0.10
11/15/2011	<1.00	<0.50
12/6/2011	<1.00	<0.10
1/3/2012	1.51	1.17
2/7/2012	1.90	1.66
2/21/2012	<1.00	<0.10
3/6/2012	4.39	3.45
4/10/2012	<0.10	
5/15/2012	<0.50	<0.10
6/5/2012		<0.10
7/3/2012	<0.50	<0.10
8/7/2012	<0.50	<0.10

Riner WWTP  
VA0024040

Effluent Hardness

Date	mg/L
9/26/2006	232
12/5/2006	190
3/6/2007	188
6/5/2007	204
9/14/2007	201
12/13/2007	262
3/6/2008	197
Mean	211



## UNIVERSAL LABORATORIES

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Hampton, Virginia 23666

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Fredericksburg, Virginia 22407

Telephone: 757-865-0880  
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Toll Free: 800-695-2162

Pace Analytical  
9800 Kincey Avenue  
Huntersville, NC 28090  
Attn: Kevin Herring

Re: TriButyltin Analysis

October 9, 2012

Dear Mr. Herring,

The sample received on 09/27/2012 for TBT analysis and labeled as 1209474-001 was flagged with a "B", showing a blank analysis contamination.

The blank result obtained with this batch was 0.13ug/L, which is above our typical report limit. The laboratory has reviewed their techniques to ensure contamination is at a minimum; however the highest possibility for contamination is the Grignard reagent used in the extraction. The reagent becomes contaminated during manufacturing and is sometimes not available without the low level contamination that we are seeing in this analysis.

We are sorry for any inconvenience that this may cause. Please let me know if you have any questions. I can be reached at the numbers above or the email address listed below.

Sincerely,

Stacie Splinter  
Quality Director  
Universal Laboratories  
[s.splinter@universallaboratories.net](mailto:s.splinter@universallaboratories.net)

# ANALYTICAL DATA REPORT

UL ORDER ID **1209474**

UL Sample Number **1209474-001**

Sample Site: **OUTFALL 001**

Grab Date/Time: **9/21/2012 08:30:00**

Client Sample ID: **OUTFALL 001**

Composite Start: **N/A**

Sample Matrix: **Wastewater**

Composite Stop: **N/A**

Collected By: **CLIENT**

Parameter	Test Result	Units	RL	Analysis Date/Time	Location	Comment
<b>GC/FPD</b>						
<b>TBT Tributyltin</b>	<b>0.32 B</b>	<b>ug/L</b>	<b>0.05</b>	<b>10/4/2012 20:04:00</b>	<b>HAM</b>	<i>Received 1L sample. Analyte was found in the blank.</i>

Comments for 1209474-001

No comments

# ANALYTICAL DATA REPORT

UL ORDER ID **1205439**

## Analytical Methods Reference

VDEH Lab# 00030 (Hampton) VDEH Lab# 00065 (Fredericksburg) NCWW Lab # 543 (Hampton)  
NCDW Lab # 51708 (Hampton) VELAP ID 460038 (Hampton) VELAP ID 460164 (Fredericksburg)

Description: Prep Method: Method Reference accredited/status

### Stormwater

TributylTin

liq/liq

GC/FPD

Accredited

NOTE: Analysis is performed according to Universal Laboratories Standard Operating Procedures which are based on the analytical methods referenced above

## GLOSSARY OF TERMS AND ABBREVIATIONS

RL (Reporting Limit): The minimum levels, concentrations, or quantities of target analyte that can be reported with a specified degree of confidence. Generally this number is near or equal to the lowest calibration standard run with the analytical batch.

MDL (Method Detection Limit): The constituent concentration that, when processed through the complete method, produces a signal with a 99% probability that it is different from the blank.

LCS (Laboratory Control Sample): Is a sample matrix free from the analytes of interest, spiked with verified amounts of analytes.

MS (Matrix Spike): a sample prepared by adding a known mass of target analyte to a specific amount of sample for which an independent estimate of target analyte concentration is available.

MSD (Matrix Spike Duplicate): Is a replicate matrix spike prepared in the laboratory and analyzed to obtain a measure of the precision recovery for each analyte.

Surrogate is a substance with properties that mimic the analyte of interest. It is unlikely to be found in environmental samples and is added to them for quality control purposes.

IS (Internal Standard): is a known amount of standard added to a test portion of the sample as a reference for evaluation and controlling the precision and bias of the applied analytical method.

RPD (Relative Percent Difference) is the difference between a set of sample duplicates or sample spike duplicates.

ICV (Initial Calibration Verification) CCV (Continuing Calibration Verification) FCV (Final Calibration Verification)

Method Blank is a sample matrix similar to the batch of associated samples that is free from analytes of interest and is processed simultaneously with and under the same conditions as samples.

Trip Blank is a sample of analyte free media collected in the same type of container that is required for the analytical test, taken from the laboratory to the sampling site and returned to the laboratory unopened. A trip blank is used to document contamination attributable to shipping and field handling procedures.

Holding Time is the maximum times that samples may be held prior to analysis and still be considered valid or not compromised.

ug/L=ppb ug/kg=ppb mg/kg=ppm mg/L=ppm

HAM= Analyzed in Hampton Lab

FRED= Analyzed in Fredericksburg Lab

QC Flag	Description
B	Analyte found in method blank
H	Holding time exceeded
L	LCS outside acceptable limits
V	ICV/CCV/FCV outside acceptable limits
D	RPD outside acceptable limits
MS	Matrix spike recovery outside acceptable limits
J	Result above calibration curve approximate value
QC	Method QC Criteria not met
MI	Matrix Interference
S	Surrogate outside acceptable limits
IS	Internal standard outside acceptable limits



Olver Laboratories Incorporated • Environmental Scientists and Consultants  
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Report No.: 17667  
Report Date: 4/14/03  
Client: Montgomery County Public Service Authority

Date Received: 3/18/03 and 3/19/03

Sample Number: 155962  
Date Collected: 3/18/03  
Time Collected: 8:30 AM  
Description: Outfall 001  
Wastewater Grab

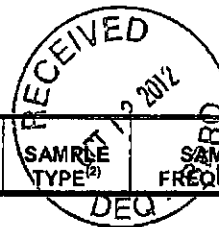
RECEIVED

MAY 12 2003

DEQ-WCRO

Analysis	Result	QL*	SSTV	Units	Date/Time Analyzed	Analyst
Total Cyanide (EPA 335.2)	BQL	10.0	N/A	µg/L	3/19/03; 0815	kblevins
Dissolved Hexavalent Chromium (SM 3500Cr,D)	BQL	2	2	µg/L	3/18/03; 1420	mferguson
Dissolved Arsenic (EPA 200.9)	BQL	10	10	µg/L	3/26/03; 1230	tstliess
Dissolved Barium (EPA 200.7)	14	2	400	µg/L	4/01/03; 1530	mplott
Dissolved Cadmium (EPA 200.9)	BQL	0.1	0.5	µg/L	3/26/03; 1100	tstliess
Dissolved Chromium III (EPA 200.7)	BQL	1	150	µg/L	4/01/03; 1530	mplott
Dissolved Copper (EPA 200.7)	BQL	10	10	µg/L	4/01/03; 1530	mplott
Dissolved Iron (EPA 200.7)	BQL	50	50	µg/L	4/01/03; 1530	mplott
Dissolved Lead (EPA 200.9)	BQL	1	2	µg/L	3/27/03; 1100	tstliess
Dissolved Manganese (EPA 200.7)	9	5	10	µg/L	4/01/03; 1530	mplott
Dissolved Mercury (EPA 163.1)	BQL	0.01	0.01	µg/L	4/04/03; N.A.	scontra
Dissolved Nickel (EPA 200.7)	BQL	3	10	µg/L	4/01/03; 1530	mplott
Dissolved Selenium (EPA 200.9)	BQL	1	2	µg/L	3/27/03; 0900	tstliess
Dissolved Silver (EPA 200.7)	3	1	5	µg/L	4/03/03; 0930	mplott
Dissolved Zinc (EPA 200.7)	66	40	50	µg/L	4/01/03; 1530	mplott

\* Quantitation Limit as depicted in VA Permit No. VA0024040. Where not specified, the QL is based on the MDL.



CASRN#	CHEMICAL	EPA ANALYSIS NO.	QUANTIFICATION LEVEL <sup>(1)</sup>	REPORTING RESULTS	SAMPLE TYPE <sup>(2)</sup>	SAMPLE FREQUENCY
<b>METALS</b>						
7440-36-0	Antimony, dissolved	(3)	5	<5.0	G or C	1/5 YR
7440-28-0	Thallium, dissolved	(4)	(5)	<10.0	G or C	1/5 YR
<b>PESTICIDES/PCB'S</b>						
72-54-8	DDD	608	0.1	<0.062	G or SC	1/5 YR
72-55-9	DDE	608	0.1	<0.062	G or SC	1/5 YR
7421-93-4	Endrin Aldehyde	(4)	(5)	<0.062	G or SC	1/5 YR
1024-57-3	Heptachlor Epoxide	(4)	(5)	<0.062	G or SC	1/5 YR
319-84-6	Hexachlorocyclohexane Alpha-BHC	608	(5)	<0.062	G or SC	1/5 YR
319-85-7	Hexachlorocyclohexane Beta-BHC	608	(5)	<0.062	G or SC	1/5 YR
143-50-0	Kepone	(9)	(5)	<10.0	G or SC	1/5 YR
<b>BASE NEUTRAL EXTRACTABLES</b>						
83-32-9	Acenaphthene	625	10.0	<5.0	G or SC	1/5 YR
92-87-5	Benzidine	(4)	(5)	<50.0	G or SC	1/5 YR
111-44-4	Bis 2-Chloroethyl Ether	(4)	(5)	<5.0	G or SC	1/5 YR
39638-32-9	Bis 2-Chloroisopropyl Ether	(4)	(5)	<5.0	G or SC	1/5 YR
85-68-7	Butyl benzyl phthalate	625	10.0	<5.0	G or SC	1/5 YR
91-58-7	2-Chloronaphthalene	(4)	(5)	<5.0	G or SC	1/5 YR
84-74-2	Dibutyl phthalate (synonym = Di-n-Butyl Phthalate)	625	10.0	<5.0	G or SC	1/5 YR
91-94-1	3,3-Dichlorobenzidine	(4)	(5)	<25.0	G or SC	1/5 YR
84-66-2	Diethyl phthalate	625	10.0	<5.0	G or SC	1/5 YR
131-11-3	Dimethyl phthalate	(4)	(5)	<5.0	G or SC	1/5 YR
122-66-7	1,2-Diphenylhydrazine	(4)	(5)	<5.0	G or SC	1/5 YR
118-74-1	Hexachlorobenzene	(4)	(5)	<5.0	G or SC	1/5 YR
87-68-3	Hexachlorobutadiene	(4)	(5)	<5.0	G or SC	1/5 YR
77-47-4	Hexachlorocyclopentadiene	(4)	(5)	<10.0	G or SC	1/5 YR
67-72-1	Hexachloroethane	(4)	(5)	<5.0	G or SC	1/5 YR
98-95-3	Nitrobenzene	625	10.0	<5.0	G or SC	1/5 YR
62-75-9	N-Nitrosodimethylamine	(4)	(5)	<5.0	G or SC	1/5 YR

CASRN#	CHEMICAL	EPA ANALYSIS NO.	QUANTIFICATION LEVEL <sup>(1)</sup>	REPORTING RESULTS	SAMPLE TYPE <sup>(2)</sup>	SAMPLE FREQUENCY
621-64-7	N-Nitrosodi-n-propylamine	(4)	(5)	<5.0	G or SC	1/5 YR
86-30-6	N-Nitrosodiphenylamine	(4)	(5)	<10.0	G or SC	1/5 YR
120-82-1	1,2,4-Trichlorobenzene	625	10.0	<5.0	G or SC	1/5 YR
<b>VOLATILES</b>						
107-02-8	Acrolein	(4)	(5)	<100	G	1/5 YR
107-13-1	Acrylonitrile	(4)	(5)	<100	G	1/5 YR
75-35-4	1,1-Dichloroethylene	624	10.0	<5.0	G	1/5 YR
156-60-5	1,2-trans-dichloroethylene	(4)	(5)	<5.0	G	1/5 YR
78-87-5	1,2-Dichloropropane	(4)	(5)	<5.0	G	1/5 YR
542-75-6	1,3-Dichloropropene	(4)	(5)	<5.0	G	1/5 YR
74-83-9	Methyl Bromide	(4)	(5)	<10.0	G	1/5 YR
79-34-5	1,1,2,2-Tetrachloroethane	(4)	(5)	<5.0	G	1/5 YR
79-00-5	1,1,2-Trichloroethane	(4)	(5)	<5.0	G	1/5 YR
<b>RADIONUCLIDES</b>						
	Strontium-90 (pCi/L)	(4)	(5)		G or G	1/5 YR
	Tritium (pCi/L)	(4)	(5)		G or G	1/5 YR
	Beta Particle & Photon Activity (mrem/yr)	(4)	(5)		G or C	1/5 YR
	Gross Alpha Particle Activity (pCi/L)	(4)	(5)		G or C	1/5 YR
<b>ACID EXTRACTABLES<sup>(6)</sup></b>						
95-57-8	2-Chlorophenol	625	10.0	<5.0	G or SC	1/5 YR
120-83-2	2,4 Dichlorophenol	625	10.0	<5.0	G or SC	1/5 YR
105-67-9	2,4 Dimethylphenol	625	10.0	<10.0	G or SC	1/5 YR
51-28-5	2,4-Dinitrophenol	(4)	(5)	<50.0	G or SC	1/5 YR
534-52-1	2-Methyl-4,6-Dinitrophenol	(4)	(5)	<20.0	G or SC	1/5 YR
<b>MISCELLANEOUS</b>						
7783-06-4	Hydrogen Sulfide	(4)	(5)	<0.10	G or SC	1/5 YR
60-10-5	Tributyltin <sup>(7)</sup>	NBSR 85-3295	(5)	0.32	G or C	1/5 YR

Robert C. Fronk, Montgomery County PSA Director  
 Name of Principal Exec. Officer or Authorized Agent/Title





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Huntersville, NC 28078  
(704)875-8092

## ANALYTICAL RESULTS

Project: MONTGOMERY COUNTY PSA RINER  
Pace Project No.: 92132417

Sample: OUTFALL 001 Lab ID: 92132417001 Collected: 09/21/12 08:30 Received: 09/21/12 12:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>608 GCS Pesticides and PCBs</b> Analytical Method: EPA 608 Preparation Method: EPA 3535								
alpha-BHC	ND	ug/L	0.062	1	09/27/12 15:00	09/28/12 23:24	319-84-6	
beta-BHC	ND	ug/L	0.062	1	09/27/12 15:00	09/28/12 23:24	319-85-7	
4,4'-DDD	ND	ug/L	0.062	1	09/27/12 15:00	09/28/12 23:24	72-54-8	
4,4'-DDE	ND	ug/L	0.062	1	09/27/12 15:00	09/28/12 23:24	72-55-9	
Endrin aldehyde	ND	ug/L	0.062	1	09/27/12 15:00	09/28/12 23:24	7421-93-4	
Heptachlor epoxide	ND	ug/L	0.062	1	09/27/12 15:00	09/28/12 23:24	1024-57-3	
<b>Surrogates</b>								
Tetrachloro-m-xylene (S)	67 %		20-110	1	09/27/12 15:00	09/28/12 23:24	877-09-8	
Decachlorobiphenyl (S)	116 %		20-138	1	09/27/12 15:00	09/28/12 23:24	2051-24-3	
<b>200.7 MET ICP, Lab Filtered</b> Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Antimony, Dissolved	ND	ug/L	5.0	1	09/26/12 15:35	09/28/12 01:41	7440-36-0	
Thallium, Dissolved	ND	ug/L	10.0	1	09/26/12 15:35	09/28/12 01:41	7440-28-0	
<b>625 MSSV</b> Analytical Method: EPA 625 Preparation Method: EPA 625								
Acenaphthene	ND	ug/L	5.0	1	09/27/12 15:00	09/29/12 10:39	83-32-9	
Benidine	ND	ug/L	50.0	1	09/27/12 15:00	09/29/12 10:39	92-87-5	
Butylbenzylphthalate	ND	ug/L	5.0	1	09/27/12 15:00	09/29/12 10:39	85-68-7	
bis(2-Chloroethyl) ether	ND	ug/L	5.0	1	09/27/12 15:00	09/29/12 10:39	111-44-4	
bis(2-Chloroisopropyl) ether	ND	ug/L	5.0	1	09/27/12 15:00	09/29/12 10:39	108-60-1	
2-Chloronaphthalene	ND	ug/L	5.0	1	09/27/12 15:00	09/29/12 10:39	91-58-7	
2-Chlorophenol	ND	ug/L	5.0	1	09/27/12 15:00	09/29/12 10:39	95-57-8	
3,3'-Dichlorobenzidine	ND	ug/L	25.0	1	09/27/12 15:00	09/29/12 10:39	91-94-1	
2,4-Dichlorophenol	ND	ug/L	5.0	1	09/27/12 15:00	09/29/12 10:39	120-83-2	
Diethylphthalate	ND	ug/L	5.0	1	09/27/12 15:00	09/29/12 10:39	84-66-2	
2,4-Dimethylphenol	ND	ug/L	10.0	1	09/27/12 15:00	09/29/12 10:39	105-67-9	
Dimethylphthalate	ND	ug/L	5.0	1	09/27/12 15:00	09/29/12 10:39	131-11-3	
Di-n-butylphthalate	ND	ug/L	5.0	1	09/27/12 15:00	09/29/12 10:39	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/L	20.0	1	09/27/12 15:00	09/29/12 10:39	534-52-1	
2,4-Dinitrophenol	ND	ug/L	50.0	1	09/27/12 15:00	09/29/12 10:39	51-28-5	
1,2-Diphenylhydrazine	ND	ug/L	5.0	1	09/27/12 15:00	09/29/12 10:39	122-86-7	
Hexachloro-1,3-butadiene	ND	ug/L	5.0	1	09/27/12 15:00	09/29/12 10:39	87-68-3	
Hexachlorobenzene	ND	ug/L	5.0	1	09/27/12 15:00	09/29/12 10:39	118-74-1	
Hexachlorocyclopentadiene	ND	ug/L	10.0	1	09/27/12 15:00	09/29/12 10:39	77-47-4	
Hexachloroethane	ND	ug/L	5.0	1	09/27/12 15:00	09/29/12 10:39	67-72-1	
Nitrobenzene	ND	ug/L	5.0	1	09/27/12 15:00	09/29/12 10:39	98-95-3	
N-Nitrosodimethylamine	ND	ug/L	5.0	1	09/27/12 15:00	09/29/12 10:39	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/L	5.0	1	09/27/12 15:00	09/29/12 10:39	621-64-7	
N-Nitrosodiphenylamine	ND	ug/L	10.0	1	09/27/12 15:00	09/29/12 10:39	86-30-6	
1,2,4-Trichlorobenzene	ND	ug/L	5.0	1	09/27/12 15:00	09/29/12 10:39	120-82-1	
<b>Surrogates</b>								
Nitrobenzene-d5 (S)	60 %		10-120	1	09/27/12 15:00	09/29/12 10:39	4165-60-0	
2-Fluorobiphenyl (S)	61 %		15-120	1	09/27/12 15:00	09/29/12 10:39	321-60-8	
Terphenyl-d14 (S)	90 %		11-131	1	09/27/12 15:00	09/29/12 10:39	1718-51-0	
Phenol-d6 (S)	19 %		10-120	1	09/27/12 15:00	09/29/12 10:39	13127-88-3	
2-Fluorophenol (S)	29 %		10-120	1	09/27/12 15:00	09/29/12 10:39	367-12-4	
2,4,6-Tribromophenol (S)	71 %		10-137	1	09/27/12 15:00	09/29/12 10:39	116-79-6	

Date: 10/10/2012 02:58 PM

## REPORT OF LABORATORY ANALYSIS

Page 10 of 21

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## ANALYTICAL RESULTS

Project: MONTGOMERY COUNTY PSA RINER  
Pace Project No.: 92132417

Sample:	OUTFALL 001	Lab ID:	92132417001	Collected:	09/21/12 08:30	Received:	09/21/12 12:15	Matrix:	Water
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
<b>8270 MSSV Semivolatile Organic</b> Analytical Method: EPA 8270 Preparation Method: EPA 3510									
Kepone	ND ug/L		10.0	1	09/28/12 16:00	10/01/12 15:29	143-50-0		
<b>Surrogates</b>									
Nitrobenzene-d5 (S)	51 %		21-110	1	09/28/12 16:00	10/01/12 16:45	4165-60-0		
2-Fluorobiphenyl (S)	49 %		27-110	1	09/28/12 16:00	10/01/12 16:45	321-60-8		
Terphenyl-d14 (S)	76 %		31-107	1	09/28/12 16:00	10/01/12 16:45	1718-51-0		
Phenol-d6 (S)	13 %		10-110	1	09/28/12 16:00	10/01/12 16:45	13127-88-3		
2-Fluorophenol (S)	21 %		12-110	1	09/28/12 16:00	10/01/12 16:45	367-12-4		
2,4,6-Tribromophenol (S)	50 %		27-110	1	09/28/12 16:00	10/01/12 16:45	118-79-6		
<b>624 Volatile Organics</b> Analytical Method: EPA 624									
Acrolein	ND ug/L		100	1		09/29/12 06:06	107-02-8		
Acrylonitrile	ND ug/L		100	1		09/29/12 06:06	107-13-1		
Bromomethane	ND ug/L		10.0	1		09/29/12 06:06	74-83-9		
1,1-Dichloroethene	ND ug/L		5.0	1		09/29/12 06:06	75-35-4		
trans-1,2-Dichloroethene	ND ug/L		5.0	1		09/29/12 06:06	156-60-5		
1,2-Dichloropropane	ND ug/L		5.0	1		09/29/12 06:06	78-87-5		
1,3-Dichloropropane	ND ug/L		5.0	1		09/29/12 06:06	142-28-9		
1,1,2,2-Tetrachloroethane	ND ug/L		5.0	1		09/29/12 06:06	79-34-5		
1,1,2-Trichloroethane	ND ug/L		5.0	1		09/29/12 06:06	79-00-5		
<b>Surrogates</b>									
Dibromofluoromethane (S)	103 %		70-130	1		09/29/12 06:06	1868-53-7		
4-Bromofluorobenzene (S)	96 %		70-130	1		09/29/12 06:06	460-00-4		
Toluene-d8 (S)	100 %		70-130	1		09/29/12 06:06	2037-26-5		
1,2-Dichloroethane-d4 (S)	103 %		70-130	1		09/29/12 06:06	17060-07-0		
<b>4500S2D Sulfide Water</b> Analytical Method: SM 4500-S2D									
Sulfide	ND mg/L		0.10	1		09/27/12 15:30	18496-25-8		



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## QUALIFIERS

Project: MONTGOMERY COUNTY PSA RINER  
Pace Project No.: 92132417

### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PRL - Pace Reporting Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Acid preservation may not be appropriate for 2-Chloroethylvinyl ether, Styrene, and Vinyl chloride.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### LABORATORIES

PASI-A Pace Analytical Services - Asheville

PASI-C Pace Analytical Services - Charlotte

### ANALYTE QUALIFIERS

- L0 Analyte recovery in the laboratory control sample (LCS) was outside QC limits.
- L2 Analyte recovery in the laboratory control sample (LCS) was below QC limits. Results for this analyte in associated samples may be biased low.
- M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.



Pace Analytical Services, Inc.  
205 East Meadow Road - Suite A  
Eden, NC 27288  
(336)623-8921

Pace Analytical Services, Inc.  
2225 Riverside Dr.  
Asheville, NC 28804  
(828)254-7176

Pace Analytical Services, Inc.  
9800 Kinney Ave. Suite 100  
Huntersville, NC 28078  
(704)875-9092

### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: MONTGOMERY COUNTY PSA RINER  
Pace Project No.: 92132417

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92132417001	OUTFALL 001	EPA 3535	OEXT/19058	EPA 608	GCSV/12956
92132417001	OUTFALL 001	EPA 200.7	MPRP/11590	EPA 200.7	ICP/10612
92132417001	OUTFALL 001	EPA 625	OEXT/19062	EPA 625	MSSV/6783
92132417001	OUTFALL 001	EPA 3510	OEXT/19087	EPA 8270	MSSV/6789
92132417001	OUTFALL 001	EPA 624	MSV/20482		
92132417001	OUTFALL 001	SM 4500-S2D	WET/22562		



Olver Laboratories Incorporated • Environmental Scientists and Consultants  
1116 South Main Street, Suite 200 • Blacksburg, Virginia 24060  
(540) 552-6974 • Fax: (540) 552-1715

Report No.: 17667  
Report Date: 4/14/03  
Client: Montgomery County Public Service Authority

Date Received: 3/18/03 and 3/19/03

Sample Number: 155962  
Date Collected: 3/18/03  
Time Collected: 8:30 AM  
Description: Outfall 001  
Wastewater Grab

RECEIVED

MAY 12 2003

REC-WCRO

Analysis	Result	QL*	Units	Date/Time Analyzed	Analyst
Pesticides (EPA 608):				3/25/03; 1759	pwilliams
Aldrin	BQL	0.05	µg/L		
Chlordane	BQL	0.2	µg/L		
4,4'DDT	BQL	0.1	µg/L		
Arochlor-1016	BQL	1.0	µg/L		
Arochlor-1221	BQL	1.0	µg/L		
Arochlor-1232	BQL	1.0	µg/L		
Arochlor-1242	BQL	1.0	µg/L		
Arochlor-1248	BQL	1.0	µg/L		
Arochlor-1254	BQL	1.0	µg/L		
Arochlor-1260	BQL	1.0	µg/L		
Dieldrin	BQL	0.1	µg/L		
Endosulfan I	BQL	0.1	µg/L		
Endosulfan II	BQL	0.1	µg/L		
Endosulfan sulfate	BQL	0.1	µg/L		
Endrin	BQL	0.1	µg/L		
gamma-BHC (Lindane)	BQL	0.05	µg/L		
Heptachlor	BQL	0.05	µg/L		
Methoxychlor	BQL	0.2	µg/L		
Mirex	BQL	0.2	µg/L		
Toxaphene	BQL	5.0	µg/L		

\* Quantitation Limit as depicted in VA Permit No. VA0024040. Where not specified, the QL is based on the MDL.



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Sample Number: 155962  
Date Collected: 3/18/03  
Time Collected: 8:30 AM  
Description: Outfall 001  
Wastewater Grab

RECEIVED

MAY 12 2003

REC'D - JCPO

Analysis	Result	QL*	Units	Date/Time Analyzed	Analyst
Pesticides (EPA 622 mod.):				3/27/03; 1628	dfaircloth
Chlorpyrifos	BQL	0.5	µg/L		
Demeton	BQL	0.5	µg/L		
Guthion	BQL	0.5	µg/L		
Malathion	BQL	0.5	µg/L		
Parathion	BQL	0.5	µg/L		
Herbicides (SW-846 8151A):				3/31/03; 1405	dfaircloth
2,4-D	BQL	2.0	µg/L		
Silvex	BQL	0.75	µg/L		
Base Neutral Extractables (EPA 625):				3/20/03; 1414	pwilliams
1,2-Dichlorobenzene	BQL	10.0	µg/L		
1,3-Dichlorobenzene	BQL	10.0	µg/L		
1,4-Dichlorobenzene	BQL	10.0	µg/L		
2,4-Dinitrotoluene	BQL	10.0	µg/L		
Anthracene	BQL	10.0	µg/L		
Benzo(a)anthracene	BQL	10.0	µg/L		
Benzo(a)pyrene	BQL	10.0	µg/L		
Benzo(b)fluoranthene	BQL	10.0	µg/L		
Benzo(k)fluoranthene	BQL	10.0	µg/L		
Bis(2-ethylhexyl)phthalate	BQL	10.0	µg/L		
Chrysene	BQL	10.0	µg/L		
Dibenzo(a,h)anthracene	BQL	20.0	µg/L		
Fluoranthene	BQL	10.0	µg/L		
Fluorene	BQL	10.0	µg/L		
Indeno(1,2,3-cd)pyrene	BQL	20.0	µg/L		

\* Quantitation Limit as depicted in VA Permit No. VA0024040. Where not specified, the QL is based on the MDL.



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(540) 552-6974 • Fax: (540) 552-1715

Report No.: 17667  
Report Date: 4/14/03  
Client: Montgomery County Public Service Authority

Date Received: 3/18/03 and 3/19/03

Sample Number: 155962  
Date Collected: 3/18/03  
Time Collected: 8:30 AM  
Description: Outfall 001  
Wastewater Grab

MAY 12 2003

DEQ-WORO

Analysis	Result	QL*	Units	Date/Time Analyzed	Analyst
Base Neutral Extractables (EPA 625) (continued):				3/20/03; 1414	pwilliams
Isophorone	BQL	10.0	µg/L		
Naphthalene	BQL	10.0	µg/L		
Pyrene	BQL	10.0	µg/L		
Acid Extractables (EPA 625):				3/20/03; 1414	pwilliams
2,4,6-Trichlorophenol	BQL	10.0	µg/L		
Pentachlorophenol	BQL	50.0	µg/L		
Phenol	BQL	10.0	µg/L		
Volatile Organic Compounds (EPA 624):				3/20/03; 1203	bpukanecz
Benzene	BQL	10.0	µg/L		
Bromoform	BQL	10.0	µg/L		
Carbon Tetrachloride	BQL	10.0	µg/L		
Chlorodibromomethane	BQL	10.0	µg/L		
Chloroform	BQL	10.0	µg/L		
Chloromethane	BQL	20.0	µg/L		
Dichloromethane	BQL	20.0	µg/L		
Dichlorobromomethane	BQL	10.0	µg/L		
1,2-Dichloroethane	BQL	10.0	µg/L		
Ethylbenzene	BQL	10.0	µg/L		
Monochlorobenzene	BQL	50.0	µg/L		
Tetrachloroethylene	BQL	10.0	µg/L		
Toluene	BQL	10.0	µg/L		
Trichloroethylene	BQL	10.0	µg/L		
Vinyl Chloride	BQL	10.0	µg/L		
Xylenes (SW-846 8021B)	BQL	1.0	µg/L	3/25/03; 1201	bpukanecz

\* Quantitation Limit as depicted in VA Permit No. VA0024040. Where not specified, the QL is based on the MDL.



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(540) 552-6974 • Fax: (540) 552-1715

Report No.: 17667  
Report Date: 4/14/03  
Client: Montgomery County Public Service Authority

Date Received: 3/18/03 and 3/19/03

Sample Number: 156004  
Date Collected: 3/18/03 - 3/19/03  
Time Collected: 7:00 AM - 7:00 AM  
Description: Outfall 001  
Wastewater Composite

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MAY 12 2003

DEL-WCRO

Analysis	Result	QL*	SSTV	Units	Date/Time Analyzed	Analyst
Sulfate (EPA 300.0)	204,000	100,000**	N/A	µg/L	3/20/03; 1320	kblevins

\* Quantitation Limit as depicted in VA Permit No. VA0024040. Where not specified, the QL is based on the MDL.

\*\* Sample required dilution; QL was raised accordingly.



## **Attachment G**

### **Preexisting Baseline Effluent Data (0.035 MGD)**

**EMS, Inc.**  
**Environmental Management Services**  
Laboratory Services - Plant Operations - Consultants  
P.O. Box 784 Wytheville, VA 24382  
Phone (276) 228-6464 Fax (276) 228-2325  
E-mail: emslab@wiredog.com

Sample No.: 08-1985

Report Date: 08-13-08

**CHAIN OF CUSTODY INFORMATION**

Client: Montgomery County PSA

Attention: Bob Fronk / Bruce Jones

Sample Source: Meadow Creek

Description: Water

Date/Time Collected: 08-11-08/0820

Collected By: Bruce Jones

Delivered To Laboratory By: Bruce Jones

Received By: Gary M. Johnson

Date/Time Received At Laboratory: 08-11-08/1030

Preservation: Cold, HNO<sub>3</sub>**ANALYTICAL DATA**

Parameter	Result	Method	Date/Time Analyzed	Analyst
Dissolved Copper, ug/L	1.61	EPA 200.8	08-12-08/1814	SC*
Dissolved Zinc, ug/L	7.26	EPA 200.8	08-12-08/1814	SC*

\* Analysis Subcontracted

Note: Sample was filtered by the client at the time of collection.

By:

  
Gary M. Johnson

DEQ LAB I.D. NO. 000110

DCLS LAB I.D. NO. 00102

US EPA LAB CODE I.D. VA01164

7/9/2008 11:28:12 AM

Facility = Riner WWTP  
Chemical = ammonia effluent baseline  
Chronic averaging period = 30  
WLAa = 2.9  
WLAc = 0.71  
Q.L. = 0.2  
# samples/mo. = 1  
# samples/wk. = 1

Summary of Statistics:

# observations = 13  
Expected Value = 199773  
Variance = .014367  
C.V. = 0.6  
97th percentile daily values = .486132  
97th percentile 4 day average = .332381  
97th percentile 30 day average = .240937  
# < Q.L. = 8  
Model used = BPJ Assumptions, Type 1 data

*below quantification level*

~~No Limit is required for this material~~

The data are:

0  
0.6  
0  
0  
0  
0  
0.3  
0  
0.2  
0  
1.27  
0.2  
0

\*\*\*\*\*

REGIONAL MODELING SYSTEM VERSION 3.2

\*\*\*\*\* Existing Conditions 4/0.035 MGD Plan \*\*\*\*\*

MODEL SIMULATION FOR THE Riner STP DISCHARGE  
TO Mill Creek

-----  
THE SIMULATION STARTS AT THE Riner STP DISCHARGE

\*\*\*\*\* PROPOSED PERMIT LIMITS \*\*\*\*\*

FLOW = .035 MGD cBOD5 = 30 Mg/L TKN = 5 Mg/L D.O. = 6 Mg/L

\*\*\*\* THE MAXIMUM CHLORINE ALLOWABLE IN THE DISCHARGE IS 0.037 Mg/L \*\*\*\*

-----  
THE SECTION BEING MODELED IS BROKEN INTO 2 SEGMENTS  
RESULTS WILL BE GIVEN AT 0.1 MILE INTERVALS

\*\*\*\*\* BACKGROUND CONDITIONS \*\*\*\*\*

THE 7Q10 STREAM FLOW AT THE DISCHARGE IS 0.08300 MGD  
THE DISSOLVED OXYGEN OF THE STREAM IS 7.518 Mg/L  
THE BACKGROUND cBOD<sub>u</sub> OF THE STREAM IS 5 Mg/L  
THE BACKGROUND nBOD OF THE STREAM IS 0 Mg/L

\*\*\*\*\* MODEL PARAMETERS \*\*\*\*\*

SEG.	LEN. Mi	VEL. F/S	K2 1/D	K1 1/D	KN 1/D	BENTHIC Mg/L	ELEV. Ft	TEMP. °C	DO-SAT Mg/L
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
1	1.02	0.865	11.765	1.400	0.350	0.227	1990.00	20.70	8.354
2	0.50	1.100	20.000	1.400	0.350	0.227	1970.00	20.70	8.360

(The K Rates shown are at 20°C ... the model corrects them for temperature.)

TOTAL STREAMFLOW = 0.1180 MGD  
(Including Discharge)

DISTANCE FROM HEAD OF SEGMENT (MI.)	TOTAL DISTANCE FROM MODEL BEGINNING (MI.)	DISSOLVED OXYGEN (Mg/L)	cBODu (Mg/L)	nBODu (Mg/L)
0.000	0.000	7.068	25.763	2.569
0.100	0.100	6.913	25.501	2.562
0.200	0.200	6.773	25.242	2.555
0.300	0.300	6.647	24.985	2.549
0.400	0.400	6.534	24.732	2.542
0.500	0.500	6.433	24.480	2.535
0.600	0.600	6.342	24.232	2.529
0.700	0.700	6.261	23.985	2.522
0.800	0.800	6.189	23.742	2.516
0.900	0.900	6.125	23.500	2.509
1.000	1.000	6.069	23.262	2.502
1.020	1.020	6.058	23.214	2.501

FOR THE TRIBUTARY AT THE END OF SEGMENT 1

FLOW = .3 MGD cBOD5 = 2 Mg/L TKN = 0 Mg/L D.O. = 7.5182 Mg/L

FLOW FROM INCREMENTAL DRAINAGE AREA = 0.0000 MGD

TOTAL STREAMFLOW = 0.4180 MGD  
(Including Discharge, Tributaries and Incremental D.A. Flow)

DISTANCE FROM HEAD OF SEGMENT (MI.)	TOTAL DISTANCE FROM MODEL BEGINNING (MI.)	DISSOLVED OXYGEN (Mg/L)	cBODu (Mg/L)	nBODu (Mg/L)
0.000	1.020	7.106	10.142	0.706
0.100	1.120	7.161	10.061	0.705
0.200	1.220	7.210	9.980	0.703
0.300	1.320	7.255	9.900	0.702
0.400	1.420	7.295	9.821	0.701
0.500	1.520	7.332	9.743	0.699

\*\*\*\*\*

REGIONAL MODELING SYSTEM Ver 3.2 (OWRM - 9/90)  
07-23-1998 07:27:58

DATA FILE = RINERX2.MOD

\*\*\*\*\*

REGIONAL MODELING SYSTEM

VERSION 3.2

DATA FILE SUMMARY

"Existing" Conditions w/ 0.035 MGD Plant

\*\*\*\*\*

THE NAME OF THE DATA FILE IS: RINERX2.MOD

THE STREAM NAME IS: Mill Creek  
THE RIVER BASIN IS: New River  
THE SECTION NUMBER IS: 2b  
THE CLASSIFICATION IS: IV

STANDARDS VIOLATED (Y/N) = N  
STANDARDS APPROPRIATE (Y/N) = Y

DISCHARGE WITHIN 3 MILES (Y/N) = N

THE DISCHARGE BEING MODELED IS: Riner STP

PROPOSED LIMITS ARE:

FLOW = .035 MGD  
BOD5 = 30 MG/L  
TKN = 5 MG/L  
D.O. = 6 MG/L

THE NUMBER OF SEGMENTS TO BE MODELED = 2

7Q10 WILL BE CALCULATED BY: DRAINAGE AREA COMPARISON

THE GAUGE NAME IS: Brush Creek  
GAUGE DRAINAGE AREA = 2.12 SQ.MI.  
GAUGE 7Q10 = .083 MGD  
DRAINAGE AREA AT DISCHARGE = 2.12 SQ.MI.

STREAM A DRY DITCH AT DISCHARGE (Y/N) = N  
ANTIDEGRADATION APPLIES (Y/N) = N

ALLOCATION DESIGN TEMPERATURE = 20.7 °C

SEGMENT INFORMATION

##### SEGMENT # 1 #####

SEGMENT ENDS BECAUSE: A TRIBUTARY ENTERS AT END

SEGMENT LENGTH = 1.02 MI

SEGMENT WIDTH = 1.55 FT

SEGMENT DEPTH = .67 FT

SEGMENT VELOCITY = 1.1 FT/SEC

DRAINAGE AREA AT SEGMENT START = 2.12 SQ.MI.

DRAINAGE AREA AT SEGMENT END = 2.12 SQ.MI.

ELEVATION AT UPSTREAM END = 2000 FT

ELEVATION AT DOWNSTREAM END = 1980 FT

THE CROSS SECTION IS: IRREGULAR

THE CHANNEL IS: SEVERELY MEANDERING

POOLS AND RIFFLES (Y/N) = N

THE BOTTOM TYPE = SILT

SLUDGE DEPOSITS = TRACE

AQUATIC PLANTS = FEW

ALGAE OBSERVED = NONE

WATER COLORED GREEN (Y/N) = N

TRIBUTARY DATA

FLOW = .3 MGD

BOD5 = 2 MG/L

TKN = 0 MG/L

D.O. = 7.5182 MG/L



SEGMENT INFORMATION

##### SEGMENT # 2 #####

SEGMENT ENDS BECAUSE: THE MODEL ENDS

SEGMENT LENGTH = .5 MI

SEGMENT WIDTH = 1.55 FT

SEGMENT DEPTH = .67 FT

SEGMENT VELOCITY = 1.1 FT/SEC

DRAINAGE AREA AT SEGMENT START = 2.12 SQ.MI.

DRAINAGE AREA AT SEGMENT END = 2.12 SQ.MI.

ELEVATION AT UPSTREAM END = 1980 FT

ELEVATION AT DOWNSTREAM END = 1960 FT

THE CROSS SECTION IS: IRREGULAR

THE CHANNEL IS: MODERATELY MEANDERING

POOLS AND RIFFLES (Y/N) = N

THE BOTTOM TYPE = SILT

SLUDGE DEPOSITS = TRACE

AQUATIC PLANTS = FEW

ALGAE OBSERVED = NONE

WATER COLORED GREEN (Y/N) = N

\*\*\*\*\*

REGIONAL MODELING SYSTEM Ver 3.2 (OWRM - 9/90)  
07-23-1998 11:01:41

## **Attachment H**

### **Wasteload and Limit Calculations**

- **Mixing Zone Calculations (MIXER 2.1)**
- **Antidegradation Wasteload Allocation Spreadsheet**
- **STATS Program Results (ammonia, copper, silver, TRC, zinc)**

## Mixing Zone Predictions for Riner WWTP

Effluent Flow = 0.10 MGD  
Stream 7Q10 = 0.11 MGD  
Stream 30Q10 = 0.14 MGD  
Stream 1Q10 = 0.10 MGD  
Stream slope = 0.01 ft/ft  
Stream width = 2.1 ft  
Bottom scale = 1  
Channel scale = 1

---

### Mixing Zone Predictions @ 7Q10

Depth = .1804 ft  
Length = 34.77 ft  
Velocity = .8568 ft/sec  
Residence Time = .0005 days

#### Recommendation:

A complete mix assumption is appropriate for this situation and the entire 7Q10 may be used.

---

### Mixing Zone Predictions @ 30Q10

Depth = .1966 ft  
Length = 32.06 ft  
Velocity = .8991 ft/sec  
Residence Time = .0004 days

#### Recommendation:

A complete mix assumption is appropriate for this situation and the entire 30Q10 may be used.

---

### Mixing Zone Predictions @ 1Q10

Depth = .1751 ft  
Length = 35.7 ft  
Velocity = .8417 ft/sec  
Residence Time = .0118 hours

#### Recommendation:

A complete mix assumption is appropriate for this situation and the entire 1Q10 may be used.

---

# FRESHWATER WATER QUALITY CRITERIA / WASTELOAD ALLOCATION ANALYSIS

Facility Name: Riner WWTP

Permit No.: VA0024040

Receiving Stream: Mill Creek

Version: OWP Guidance Memo 00-2011 (8/24/00)

Stream Information		Stream Flows		Mixing Information		Effluent Information	
Mean Hardness (as CaCO <sub>3</sub> ) =	208 mg/L	1Q10 (Annual) =	0.1 MGD	Annual - 1Q10 Mix =	100 %	Mean Hardness (as CaCO <sub>3</sub> ) =	211 mg/L
90% Temperature (Annual) =	19.8 deg C	7Q10 (Annual) =	0.11 MGD	- 7Q10 Mix =	100 %	90% Temp (Annual) =	25.9 deg C
90% Temperature (Wet season) =	16 deg C	30Q10 (Annual) =	0.14 MGD	- 30Q10 Mix =	100 %	90% Temp (Wet season) =	18.4 deg C
90% Maximum pH =	8.2 SU	1Q10 (Wet season) =	0.18 MGD	Wet Season - 1Q10 Mix =	100 %	90% Maximum pH =	7.6 SU
10% Maximum pH =	7.5 SU	30Q10 (Wet season) =	0.31 MGD	- 30Q10 Mix =	100 %	10% Maximum pH =	7.1 SU
Tier Designation (1 or 2) =	2	30Q5 =	0.17 MGD			Discharge Flow =	0.1 MGD
Public Water Supply (PWS) Y/N? =	n	Harmonic Mean =	0.45 MGD				
Trout Present Y/N? =	n						
Early Life Stages Present Y/N? =	y						

Parameter (ug/l unless noted)	Background Conc.	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
		Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Acenaphthene	0	--	--	na	9.9E+02	--	--	na	2.7E+03	--	--	na	9.9E+01	--	--	na	2.7E+02	--	--	na	2.7E+02
Acrolein	0	--	--	na	9.3E+00	--	--	na	2.5E+01	--	--	na	9.3E-01	--	--	na	2.5E+00	--	--	na	2.5E+00
Acrylonitrile <sup>C</sup>	0	--	--	na	2.5E+00	--	--	na	1.4E+01	--	--	na	2.5E-01	--	--	na	1.4E+00	--	--	na	1.4E+00
Aldrin <sup>C</sup>	0	3.0E+00	--	na	5.0E-04	6.0E+00	--	na	2.8E-03	7.5E-01	--	na	5.0E-05	1.5E+00	--	na	2.8E-04	1.5E+00	--	na	2.8E-04
Ammonia-N (mg/l) (Yearly)	0	1.21E+01	1.81E+00	na	--	2.4E+01	4.3E+00	na	--	3.01E+00	4.51E-01	na	--	6.0E+00	1.1E+00	na	--	6.0E+00	1.1E+00	na	--
Ammonia-N (mg/l) (High Flow)	0	1.04E+01	2.25E+00	na	--	2.9E+01	9.2E+00	na	--	2.60E+00	5.62E-01	na	--	7.3E+00	2.3E+00	na	--	7.3E+00	2.3E+00	na	--
Anthracene	0	--	--	na	4.0E+04	--	--	na	1.1E+05	--	--	na	4.0E+03	--	--	na	1.1E+04	--	--	na	1.1E+04
Antimony	0	--	--	na	6.4E+02	--	--	na	1.7E+03	--	--	na	6.4E+01	--	--	na	1.7E+02	--	--	na	1.7E+02
Arsenic	0	3.4E+02	1.5E+02	na	--	6.8E+02	3.2E+02	na	--	8.5E+01	3.8E+01	na	--	1.7E+02	7.9E+01	na	--	1.7E+02	7.9E+01	na	--
Barium	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--
Benzene <sup>C</sup>	0	--	--	na	5.1E+02	--	--	na	2.8E+03	--	--	na	5.1E+01	--	--	na	2.8E+02	--	--	na	2.8E+02
Benzidine <sup>C</sup>	0	--	--	na	2.0E-03	--	--	na	1.1E-02	--	--	na	2.0E-04	--	--	na	1.1E-03	--	--	na	1.1E-03
Benzo (a) anthracene <sup>C</sup>	0	--	--	na	1.8E-01	--	--	na	9.9E-01	--	--	na	1.8E-02	--	--	na	9.9E-02	--	--	na	9.9E-02
Benzo (b) fluoranthene <sup>C</sup>	0	--	--	na	1.8E-01	--	--	na	9.9E-01	--	--	na	1.8E-02	--	--	na	9.9E-02	--	--	na	9.9E-02
Benzo (k) fluoranthene <sup>C</sup>	0	--	--	na	1.8E-01	--	--	na	9.9E-01	--	--	na	1.8E-02	--	--	na	9.9E-02	--	--	na	9.9E-02
Benzo (a) pyrene <sup>C</sup>	0	--	--	na	1.8E-01	--	--	na	9.9E-01	--	--	na	1.8E-02	--	--	na	9.9E-02	--	--	na	9.9E-02
Bis(2-Chloroethyl) Ether <sup>C</sup>	0	--	--	na	5.3E+00	--	--	na	2.9E+01	--	--	na	5.3E-01	--	--	na	2.9E+00	--	--	na	2.9E+00
Bis(2-Chloroisopropyl) Ether	0	--	--	na	5.5E+04	--	--	na	1.8E+05	--	--	na	6.5E+03	--	--	na	1.8E+04	--	--	na	1.8E+04
Bis 2-Ethylhexyl Phthalate <sup>C</sup>	0	--	--	na	2.2E+01	--	--	na	1.2E+02	--	--	na	2.2E+00	--	--	na	1.2E+01	--	--	na	1.2E+01
Bromoform <sup>C</sup>	0	--	--	na	1.4E+03	--	--	na	7.7E+03	--	--	na	1.4E+02	--	--	na	7.7E+02	--	--	na	7.7E+02
Butylbenzylphthalate	0	--	--	na	1.9E+03	--	--	na	5.1E+03	--	--	na	1.9E+02	--	--	na	5.1E+02	--	--	na	5.1E+02
Cadmium	0	9.0E+00	2.0E+00	na	--	1.8E+01	4.3E+00	na	--	2.3E+00	5.1E-01	na	--	4.5E+00	1.1E+00	na	--	4.5E+00	1.1E+00	na	--
Carbon Tetrachloride <sup>C</sup>	0	--	--	na	1.6E+01	--	--	na	8.8E+01	--	--	na	1.6E+00	--	--	na	8.8E+00	--	--	na	8.8E+00
Chlordane <sup>C</sup>	0	2.4E+00	4.3E-03	na	8.1E-03	4.8E+00	9.0E-03	na	4.5E-02	6.0E-01	1.1E-03	na	8.1E-04	1.2E+00	2.3E-03	na	4.5E-03	1.2E+00	2.3E-03	na	4.5E-03
Chloride	0	8.6E+05	2.3E+05	na	--	1.7E+06	4.8E+05	na	--	2.2E+05	5.8E+04	na	--	4.3E+05	1.2E+05	na	--	4.3E+05	1.2E+05	na	--
TRC	0	1.9E+01	1.1E+01	na	--	3.8E+01	2.3E+01	na	--	4.8E+00	2.8E+00	na	--	9.5E+00	5.8E+00	na	--	9.5E+00	5.8E+00	na	--
Chlorobenzene	0	--	--	na	1.6E+03	--	--	na	4.3E+03	--	--	na	1.6E+02	--	--	na	4.3E+02	--	--	na	4.3E+02

Parameter (ug/l unless noted)	Background Conc.	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
		Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Chlorodibromomethane <sup>C</sup>	0	--	--	na	1.3E+02	--	--	na	7.2E+02	--	--	na	1.3E+01	--	--	na	7.2E+01	--	--	na	7.2E+01
Chloroform	0	--	--	na	1.1E+04	--	--	na	3.0E+04	--	--	na	1.1E+03	--	--	na	3.0E+03	--	--	na	3.0E+03
2-Chloronaphthalene	0	--	--	na	1.6E+03	--	--	na	4.3E+03	--	--	na	1.6E+02	--	--	na	4.3E+02	--	--	na	4.3E+02
2-Chlorophenol	0	--	--	na	1.5E+02	--	--	na	4.1E+02	--	--	na	1.5E+01	--	--	na	4.1E+01	--	--	na	4.1E+01
Chlorpyrifos	0	8.3E-02	4.1E-02	na	--	1.7E-01	8.6E-02	na	--	2.1E-02	1.0E-02	na	--	4.2E-02	2.2E-02	na	--	4.2E-02	2.2E-02	na	--
Chromium III	0	1.0E+03	1.4E+02	na	--	2.1E+03	2.9E+02	na	--	2.6E+02	3.4E+01	na	--	5.2E+02	7.1E+01	na	--	5.2E+02	7.1E+01	na	--
Chromium VI	0	1.6E+01	1.1E+01	na	--	3.2E+01	2.3E+01	na	--	4.0E+00	2.8E+00	na	--	8.0E+00	5.8E+00	na	--	8.0E+00	5.8E+00	na	--
Chromium, Total	0	--	--	1.0E+02	--	--	--	na	--	--	--	1.0E+01	--	--	--	2.7E+01	--	--	--	na	--
Chrysene <sup>C</sup>	0	--	--	na	1.8E-02	--	--	na	9.9E-02	--	--	na	1.8E-03	--	--	na	9.9E-03	--	--	na	9.9E-03
Copper	1.61	2.7E+01	1.7E+01	na	--	5.2E+01	3.4E+01	na	--	8.0E+00	5.4E+00	na	--	1.4E+01	9.6E+00	na	--	1.4E+01	9.6E+00	na	--
Cyanide, Free	0	2.2E+01	5.2E+00	na	1.6E+04	4.4E+01	1.1E+01	na	4.3E+04	5.5E+00	1.3E+00	na	1.6E+03	1.1E+01	2.7E+00	na	4.3E+03	1.1E+01	2.7E+00	na	4.3E+03
DDD <sup>C</sup>	0	--	--	na	3.1E-03	--	--	na	1.7E-02	--	--	na	3.1E-04	--	--	na	1.7E-03	--	--	na	1.7E-03
DDE <sup>C</sup>	0	--	--	na	2.2E-03	--	--	na	1.2E-02	--	--	na	2.2E-04	--	--	na	1.2E-03	--	--	na	1.2E-03
DDT <sup>C</sup>	0	1.1E+00	1.0E-03	na	2.2E-03	2.2E+00	2.1E-03	na	1.2E-02	2.8E-01	2.5E-04	na	2.2E-04	5.5E-01	5.3E-04	na	1.2E-03	5.5E-01	5.3E-04	na	1.2E-03
Demeton	0	--	1.0E-01	na	--	--	2.1E-01	na	--	--	2.5E-02	na	--	--	5.3E-02	na	--	--	5.3E-02	na	--
Diazinon	0	1.7E-01	1.7E-01	na	--	3.4E-01	3.6E-01	na	--	4.3E-02	4.3E-02	na	--	8.5E-02	8.9E-02	na	--	8.5E-02	8.9E-02	na	--
Dibenz(a,h)anthracene <sup>C</sup>	0	--	--	na	1.8E-01	--	--	na	9.9E-01	--	--	na	1.8E-02	--	--	na	9.9E-02	--	--	na	9.9E-02
1,2-Dichlorobenzene	0	--	--	na	1.3E+03	--	--	na	3.5E+03	--	--	na	1.3E+02	--	--	na	3.5E+02	--	--	na	3.5E+02
1,3-Dichlorobenzene	0	--	--	na	9.6E+02	--	--	na	2.6E+03	--	--	na	9.6E+01	--	--	na	2.6E+02	--	--	na	2.6E+02
1,4-Dichlorobenzene	0	--	--	na	1.9E+02	--	--	na	5.1E+02	--	--	na	1.9E+01	--	--	na	5.1E+01	--	--	na	5.1E+01
3,3-Dichlorobenzidine <sup>C</sup>	0	--	--	na	2.8E-01	--	--	na	1.5E+00	--	--	na	2.8E-02	--	--	na	1.5E-01	--	--	na	1.5E-01
Dichlorobromomethane <sup>C</sup>	0	--	--	na	1.7E+02	--	--	na	9.4E+02	--	--	na	1.7E+01	--	--	na	9.4E+01	--	--	na	9.4E+01
1,2-Dichloroethane <sup>C</sup>	0	--	--	na	3.7E+02	--	--	na	2.0E+03	--	--	na	3.7E+01	--	--	na	2.0E+02	--	--	na	2.0E+02
1,1-Dichloroethylene	0	--	--	na	7.1E+03	--	--	na	1.9E+04	--	--	na	7.1E+02	--	--	na	1.9E+03	--	--	na	1.9E+03
1,2-trans-dichloroethylene	0	--	--	na	1.0E+04	--	--	na	2.7E+04	--	--	na	1.0E+03	--	--	na	2.7E+03	--	--	na	2.7E+03
2,4-Dichlorophenol	0	--	--	na	2.9E+02	--	--	na	7.8E+02	--	--	na	2.9E+01	--	--	na	7.8E+01	--	--	na	7.8E+01
2,4-Dichlorophenoxy acetic acid (2,4-D)	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--
1,2-Dichloropropane <sup>C</sup>	0	--	--	na	1.5E+02	--	--	na	8.3E+02	--	--	na	1.5E+01	--	--	na	8.3E+01	--	--	na	8.3E+01
1,3-Dichloropropene <sup>C</sup>	0	--	--	na	2.1E+02	--	--	na	1.2E+03	--	--	na	2.1E+01	--	--	na	1.2E+02	--	--	na	1.2E+02
Dieldrin <sup>C</sup>	0	2.4E-01	5.6E-02	na	5.4E-04	4.8E-01	1.2E-01	na	3.0E-03	6.0E-02	1.4E-02	na	5.4E-05	1.2E-01	2.9E-02	na	3.0E-04	1.2E-01	2.9E-02	na	3.0E-04
Diethyl Phthalate	0	--	--	na	4.4E+04	--	--	na	1.2E+05	--	--	na	4.4E+03	--	--	na	1.2E+04	--	--	na	1.2E+04
2,4-Dimethylphenol	0	--	--	na	8.5E+02	--	--	na	2.3E+03	--	--	na	8.5E+01	--	--	na	2.3E+02	--	--	na	2.3E+02
Dimethyl Phthalate	0	--	--	na	1.1E+05	--	--	na	3.0E+06	--	--	na	1.1E+05	--	--	na	3.0E+05	--	--	na	3.0E+05
Di-n-Butyl Phthalate	0	--	--	na	4.5E+03	--	--	na	1.2E+04	--	--	na	4.5E+02	--	--	na	1.2E+03	--	--	na	1.2E+03
2,4 Dinitrophenol	0	--	--	na	5.3E+03	--	--	na	1.4E+04	--	--	na	5.3E+02	--	--	na	1.4E+03	--	--	na	1.4E+03
2-Methyl-4,6-Dinitrophenol	0	--	--	na	2.8E+02	--	--	na	7.6E+02	--	--	na	2.8E+01	--	--	na	7.6E+01	--	--	na	7.6E+01
2,4-Dinitrotoluene <sup>C</sup>	0	--	--	na	3.4E+01	--	--	na	1.9E+02	--	--	na	3.4E+00	--	--	na	1.9E+01	--	--	na	1.9E+01
Dioxin 2,3,7,8- tetrachlorodibenzo-p-dioxin	0	--	--	na	5.1E-08	--	--	na	1.4E-07	--	--	na	5.1E-09	--	--	na	1.4E-08	--	--	na	1.4E-08
1,2-Diphenylhydrazine <sup>C</sup>	0	--	--	na	2.0E+00	--	--	na	1.1E+01	--	--	na	2.0E-01	--	--	na	1.1E+00	--	--	na	1.1E+00
Alpha-Endosulfan	0	2.2E-01	5.6E-02	na	8.9E+01	4.4E-01	1.2E-01	na	2.4E+02	5.5E-02	1.4E-02	na	8.9E+00	1.1E-01	2.9E-02	na	2.4E+01	1.1E-01	2.9E-02	na	2.4E+01
Beta-Endosulfan	0	2.2E-01	5.6E-02	na	8.9E+01	4.4E-01	1.2E-01	na	2.4E+02	5.5E-02	1.4E-02	na	8.9E+00	1.1E-01	2.9E-02	na	2.4E+01	1.1E-01	2.9E-02	na	2.4E+01
Alpha + Beta Endosulfan	0	2.2E-01	5.6E-02	--	--	4.4E-01	1.2E-01	--	--	5.5E-02	1.4E-02	--	--	1.1E-01	2.9E-02	--	--	1.1E-01	2.9E-02	--	--
Endosulfan Sulfate	0	--	--	na	8.9E+01	--	--	na	2.4E+02	--	--	na	8.9E+00	--	--	na	2.4E+01	--	--	na	2.4E+01
Endrin	0	8.6E-02	3.6E-02	na	6.0E-02	1.7E-01	7.6E-02	na	1.6E-01	2.2E-02	9.0E-03	na	6.0E-03	4.3E-02	1.9E-02	na	1.6E-02	4.3E-02	1.9E-02	na	1.6E-02
Endrin Aldehyde	0	--	--	na	3.0E-01	--	--	na	8.1E-01	--	--	na	3.0E-02	--	--	na	8.1E-02	--	--	na	8.1E-02

Parameter (ug/l unless noted)	Background Conc.	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
		Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Ethylbenzene	0	--	--	na	2.1E+03	--	--	na	5.7E+03	--	--	na	2.1E+02	--	--	na	5.7E+02	--	--	na	5.7E+02
Fluoranthene	0	--	--	na	1.4E+02	--	--	na	3.8E+02	--	--	na	1.4E+01	--	--	na	3.8E+01	--	--	na	3.8E+01
Fluorene	0	--	--	na	5.3E+03	--	--	na	1.4E+04	--	--	na	5.3E+02	--	--	na	1.4E+03	--	--	na	1.4E+03
Foaming Agents	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--
Guthion	0	--	1.0E-02	na	--	--	2.1E-02	na	--	--	2.5E-03	na	--	--	5.3E-03	na	--	--	5.3E-03	na	--
Heptachlor <sup>C</sup>	0	5.2E-01	3.8E-03	na	7.9E-04	1.0E+00	8.0E-03	na	4.3E-03	1.3E-01	9.5E-04	na	7.9E-05	2.6E-01	2.0E-03	na	4.3E-04	2.6E-01	2.0E-03	na	4.3E-04
Heptachlor Epoxide <sup>C</sup>	0	5.2E-01	3.8E-03	na	3.9E-04	1.0E+00	8.0E-03	na	2.1E-03	1.3E-01	9.5E-04	na	3.9E-05	2.6E-01	2.0E-03	na	2.1E-04	2.6E-01	2.0E-03	na	2.1E-04
Hexachlorobenzene <sup>C</sup>	0	--	--	na	2.9E-03	--	--	na	1.6E-02	--	--	na	2.9E-04	--	--	na	1.6E-03	--	--	na	1.6E-03
Hexachlorobutadiene <sup>C</sup>	0	--	--	na	1.8E+02	--	--	na	9.9E+02	--	--	na	1.8E+01	--	--	na	9.9E+01	--	--	na	9.9E+01
Hexachlorocyclohexane																					
Alpha-BHC <sup>C</sup>	0	--	--	na	4.9E-02	--	--	na	2.7E-01	--	--	na	4.9E-03	--	--	na	2.7E-02	--	--	na	2.7E-02
Hexachlorocyclohexane																					
Beta-BHC <sup>C</sup>	0	--	--	na	1.7E-01	--	--	na	9.4E-01	--	--	na	1.7E-02	--	--	na	9.4E-02	--	--	na	9.4E-02
Hexachlorocyclohexane																					
Gamma-BHC <sup>C</sup> (Lindane)	0	9.5E-01	na	na	1.8E+00	1.9E+00	--	na	9.9E+00	2.4E-01	--	na	1.8E-01	4.8E-01	--	na	9.9E-01	4.8E-01	--	na	9.9E-01
Hexachlorocyclopentadiene	0	--	--	na	1.1E+03	--	--	na	3.0E+03	--	--	na	1.1E+02	--	--	na	3.0E+02	--	--	na	3.0E+02
Hexachloroethane <sup>C</sup>	0	--	--	na	3.3E+01	--	--	na	1.8E+02	--	--	na	3.3E+00	--	--	na	1.8E+01	--	--	na	1.8E+01
Hydrogen Sulfide	0	--	2.0E+00	na	--	--	4.2E+00	na	--	--	5.0E-01	na	--	--	1.1E+00	na	--	--	1.1E+00	na	--
Indeno (1,2,3-cd) pyrene <sup>C</sup>	0	--	--	na	1.8E-01	--	--	na	9.9E-01	--	--	na	1.8E-02	--	--	na	9.9E-02	--	--	na	9.9E-02
Iron	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--
Isophorone <sup>C</sup>	0	--	--	na	9.6E+03	--	--	na	5.3E+04	--	--	na	9.6E+02	--	--	na	5.3E+03	--	--	na	5.3E+03
Kepone	0	--	0.0E+00	na	--	--	0.0E+00	na	--	--	0.0E+00	na	--	--	0.0E+00	na	--	--	0.0E+00	na	--
Lead	0	3.0E+02	3.5E+01	na	--	6.1E+02	7.3E+01	na	--	7.6E+01	8.7E+00	na	--	1.5E+02	1.8E+01	na	--	1.5E+02	1.8E+01	na	--
Malathion	0	--	1.0E-01	na	--	--	2.1E-01	na	--	--	2.5E-02	na	--	--	5.3E-02	na	--	--	5.3E-02	na	--
Manganese	78.9	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--
Mercury	0	1.4E+00	7.7E-01	--	--	2.8E+00	1.6E+00	--	--	3.5E-01	1.9E-01	--	--	7.0E-01	4.0E-01	--	--	7.0E-01	4.0E-01	--	--
Methyl Bromide	0	--	--	na	1.5E+03	--	--	na	4.1E+03	--	--	na	1.5E+02	--	--	na	4.1E+02	--	--	na	4.1E+02
Methylene Chloride <sup>C</sup>	0	--	--	na	5.9E+03	--	--	na	3.2E+04	--	--	na	5.9E+02	--	--	na	3.2E+03	--	--	na	3.2E+03
Methoxychlor	0	--	3.0E-02	na	--	--	6.3E-02	na	--	--	7.5E-03	na	--	--	1.6E-02	na	--	--	1.6E-02	na	--
Mirex	0	--	0.0E+00	na	--	--	0.0E+00	na	--	--	0.0E+00	na	--	--	0.0E+00	na	--	--	0.0E+00	na	--
Nickel	0	3.4E+02	3.8E+01	na	4.6E+03	6.8E+02	8.0E+01	na	1.2E+04	8.5E+01	9.5E+00	na	4.6E+02	1.7E+02	2.0E+01	na	1.2E+03	1.7E+02	2.0E+01	na	1.2E+03
Nitrate (as N)	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--
Nitrobenzene	0	--	--	na	6.9E+02	--	--	na	1.9E+03	--	--	na	6.9E+01	--	--	na	1.9E+02	--	--	na	1.9E+02
N-Nitrosodimethylamine <sup>C</sup>	0	--	--	na	3.0E+01	--	--	na	1.7E+02	--	--	na	3.0E+00	--	--	na	1.7E+01	--	--	na	1.7E+01
N-Nitrosodiphenylamine <sup>C</sup>	0	--	--	na	6.0E+01	--	--	na	3.3E+02	--	--	na	6.0E+00	--	--	na	3.3E+01	--	--	na	3.3E+01
N-Nitrosodi-n-propylamine <sup>C</sup>	0	--	--	na	5.1E+00	--	--	na	2.8E+01	--	--	na	5.1E-01	--	--	na	2.8E+00	--	--	na	2.8E+00
Nonylphenol	0	2.8E+01	6.6E+00	--	--	5.6E+01	1.4E+01	na	--	7.0E+00	1.7E+00	--	--	1.4E+01	3.5E+00	--	--	1.4E+01	3.5E+00	na	--
Parathion	0	6.5E-02	1.3E-02	na	--	1.3E-01	2.7E-02	na	--	1.6E-02	3.3E-03	na	--	3.3E-02	6.8E-03	na	--	3.3E-02	6.8E-03	na	--
PCB Total <sup>C</sup>	0	--	1.4E-02	na	6.4E-04	--	2.9E-02	na	3.5E-03	--	3.5E-03	na	6.4E-05	--	7.4E-03	na	3.5E-04	--	7.4E-03	na	3.5E-04
Pentachlorophenol <sup>C</sup>	0	1.1E+01	8.7E+00	na	3.0E+01	2.3E+01	1.8E+01	na	1.7E+02	2.8E+00	2.2E+00	na	3.0E+00	5.6E+00	4.6E+00	na	1.7E+01	5.6E+00	4.6E+00	na	1.7E+01
Phenol	0	--	--	na	8.6E+05	--	--	na	2.3E+06	--	--	na	8.6E+04	--	--	na	2.3E+05	--	--	na	2.3E+05
Pyrene	0	--	--	na	4.0E+03	--	--	na	1.1E+04	--	--	na	4.0E+02	--	--	na	1.1E+03	--	--	na	1.1E+03
Radionuclides																					
Gross Alpha Activity (pCi/L)	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--
Beta and Photon Activity (mrem/yr)	0	--	--	na	4.0E+00	--	--	na	1.1E+01	--	--	na	4.0E-01	--	--	na	1.1E+00	--	--	na	1.1E+00
Radium 226 + 228 (pCi/L)	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--
Uranium (ug/l)	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--

Parameter (ug/l unless noted)	Background Conc.	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
		Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Selenium, Total Recoverable	0	2.0E+01	5.0E+00	na	4.2E+03	4.0E+01	1.1E+01	na	1.1E+04	5.0E+00	1.3E+00	na	4.2E+02	1.0E+01	2.6E+00	na	1.1E+03	1.0E+01	2.6E+00	na	1.1E+03
Silver	0	1.2E+01	--	na	--	2.5E+01	--	na	--	3.1E+00	--	na	--	6.2E+00	--	na	--	6.2E+00	--	na	--
Sulfate	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--
1,1,2,2-Tetrachloroethane <sup>C</sup>	0	--	--	na	4.0E+01	--	--	na	2.2E+02	--	--	na	4.0E+00	--	--	na	2.2E+01	--	--	na	2.2E+01
Tetrachloroethylene <sup>C</sup>	0	--	--	na	3.3E+01	--	--	na	1.8E+02	--	--	na	3.3E+00	--	--	na	1.8E+01	--	--	na	1.8E+01
Thallium	0	--	--	na	4.7E-01	--	--	na	1.3E+00	--	--	na	4.7E-02	--	--	na	1.3E-01	--	--	na	1.3E-01
Toluene	0	--	--	na	6.0E+03	--	--	na	1.6E+04	--	--	na	6.0E+02	--	--	na	1.6E+03	--	--	na	1.6E+03
Total dissolved solids	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--
Toxaphene <sup>C</sup>	0	7.3E-01	2.0E-04	na	2.8E-03	1.5E+00	4.2E-04	na	1.5E-02	1.8E-01	5.0E-05	na	2.8E-04	3.7E-01	1.1E-04	na	1.5E-03	3.7E-01	1.1E-04	na	1.5E-03
Tributyltin	0	4.6E-01	7.2E-02	na	--	9.2E-01	1.5E-01	na	--	1.2E-01	1.8E-02	na	--	2.3E-01	3.8E-02	na	--	2.3E-01	3.8E-02	na	--
1,2,4-Trichlorobenzene	0	--	--	na	7.0E+01	--	--	na	1.9E+02	--	--	na	7.0E+00	--	--	na	1.9E+01	--	--	na	1.9E+01
1,1,2-Trichloroethane <sup>C</sup>	0	--	--	na	1.6E+02	--	--	na	8.8E+02	--	--	na	1.6E+01	--	--	na	8.8E+01	--	--	na	8.8E+01
Trichloroethylene <sup>C</sup>	0	--	--	na	3.0E+02	--	--	na	1.7E+03	--	--	na	3.0E+01	--	--	na	1.7E+02	--	--	na	1.7E+02
2,4,6-Trichlorophenol <sup>C</sup>	0	--	--	na	2.4E+01	--	--	na	1.3E+02	--	--	na	2.4E+00	--	--	na	1.3E+01	--	--	na	1.3E+01
2-(2,4,5-Trichlorophenoxy) propionic acid (Silvex)	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--
Vinyl Chloride <sup>C</sup>	0	--	--	na	2.4E+01	--	--	na	1.3E+02	--	--	na	2.4E+00	--	--	na	1.3E+01	--	--	na	1.3E+01
Zinc	7.26	2.2E+02	2.2E+02	na	2.6E+04	4.3E+02	4.6E+02	na	7.0E+04	6.0E+01	6.1E+01	na	2.6E+03	1.1E+02	1.2E+02	na	7.0E+03	1.1E+02	1.2E+02	na	7.0E+03

#### Notes:

- All concentrations expressed as micrograms/liter (ug/l), unless noted otherwise
- Discharge flow is highest monthly average or Form 2C maximum for industries and design flow for Municipals
- Metals measured as Dissolved, unless specified otherwise
- "C" indicates a carcinogenic parameter
- Regular WLAs are mass balances (minus background concentration) using the % of stream flow entered above under Mixing Information.  
Antidegradation WLAs are based upon a complete mix.
- Antideg. Baseline =  $(0.25(\text{WQC} - \text{background conc.}) + \text{background conc.})$  for acute and chronic  
=  $(0.1(\text{WQC} - \text{background conc.}) + \text{background conc.})$  for human health
- WLAs established at the following stream flows: 1Q10 for Acute, 30Q10 for Chronic Ammonia, 7Q10 for Other Chronic, 30Q5 for Non-carcinogens and Harmonic Mean for Carcinogens. To apply mixing ratios from a model set the stream flow equal to (mixing ratio - 1), effluent flow equal to 1 and 100% mix.

Metal	Target Value (SSTV)
Antimony	1.7E+02
Arsenic	4.7E+01
Barium	na
Cadmium	6.4E-01
Chromium III	4.3E+01
Chromium VI	3.2E+00
Copper	5.7E+00
Iron	na
Lead	1.1E+01
Manganese	na
Mercury	2.4E-01
Nickel	1.2E+01
Selenium	1.6E+00
Silver	2.5E+00
Zinc	4.5E+01

Note: do not use QL's lower than the minimum QL's provided in agency guidance

### 0.100 MGD DISCHARGE FLOW - STREAM MIX PER "Mix.exe"

Discharge Flow Used for WQS-WLA Calculations (MGD) 0.100					<b><u>Ammonia - Dry Season - Acute</u></b>		<b><u>Ammonia - Dry Season - Chronic</u></b>	
<b>Stream Flows</b>		<b>Total Mix Flows</b>			90th Percentile pH (SU)	7.804	90th Percentile Temp. (deg C)	22.342
<b><u>Allocated to Mix (MGD)</u></b>		<b><u>Stream + Discharge (MGD)</u></b>			(7.204 - pH)	-0.600	90th Percentile pH (SU)	7.849
	<b><u>Dry Season</u></b>	<b><u>Wet Season</u></b>	<b><u>Dry Season</u></b>	<b><u>Wet Season</u></b>	(pH - 7.204)	0.600	MIN	1.721
1Q10	0.100	0.180	0.200	0.280	Trout Present Criterion (mg N/L)	8.054	MAX	22.342
7Q10	0.110	N/A	0.210	N/A	Trout Absent Criterion (mg N/L)	12.059	(7.688 - pH)	-0.161
30Q10	0.140	0.310	0.240	0.410	Trout Present?	n	(pH - 7.688)	0.161
30Q5	0.170	N/A	0.270	N/A	Effective Criterion (mg N/L)	12.059	Early LS Present Criterion (mg N/L)	1.806
Harm. Mean	0.450	N/A	0.550	N/A			Early LS Absent Criterion (mg N/L)	1.806
Annual Avg.	0.000	N/A	0.100	N/A			Early Life Stages Present?	y
							Effective Criterion (mg N/L)	1.806
<b><u>Stream/Discharge Mix Values</u></b>					<b><u>Ammonia - Wet Season - Acute</u></b>		<b><u>Ammonia - Wet Season - Chronic</u></b>	
		<b><u>Dry Season</u></b>	<b><u>Wet Season</u></b>		90th Percentile pH (SU)	7.885	90th Percentile Temp. (deg C)	16.585
1Q10 90th% Temp. Mix (deg C)		22.850	16.857		(7.204 - pH)	-0.681	90th Percentile pH (SU)	7.963
30Q10 90th% Temp. Mix (deg C)		22.342	16.585		(pH - 7.204)	0.681	MIN	2.494
1Q10 90th% pH Mix (SU)		7.804	7.885		Trout Present Criterion (mg N/L)	6.953	MAX	16.585
30Q10 90th% pH Mix (SU)		7.849	7.963		Trout Absent Criterion (mg N/L)	10.411	(7.688 - pH)	-0.275
1Q10 10th% pH Mix (SU)		7.255	N/A		Trout Present?	n	(pH - 7.688)	0.275
7Q10 10th% pH Mix (SU)		7.264	N/A		Effective Criterion (mg N/L)	10.411	Early LS Present Criterion (mg N/L)	2.246
		<b><u>Calculated</u></b>	<b><u>Formula Inputs</u></b>				Early LS Absent Criterion (mg N/L)	2.246
1Q10 Hardness (mg/L as CaCO3)		209.5	209.5				Early Life Stages Present?	y
7Q10 Hardness (mg/L as CaCO3)		209.4	209.4				Effective Criterion (mg N/L)	2.246

### 0.100 MGD DISCHARGE FLOW - COMPLETE STREAM MIX

Discharge Flow Used for WQS-WLA Calculations (MGD) 0.100					<b><u>Ammonia - Dry Season - Acute</u></b>		<b><u>Ammonia - Dry Season - Chronic</u></b>	
<b>100% Stream Flows</b>		<b>Total Mix Flows</b>			90th Percentile pH (SU)	7.804	90th Percentile Temp. (deg C)	22.342
<b><u>Allocated to Mix (MGD)</u></b>		<b><u>Stream + Discharge (MGD)</u></b>			(7.204 - pH)	-0.600	90th Percentile pH (SU)	7.849
	<b><u>Dry Season</u></b>	<b><u>Wet Season</u></b>	<b><u>Dry Season</u></b>	<b><u>Wet Season</u></b>	(pH - 7.204)	0.600	MIN	1.721
1Q10	0.100	0.180	0.200	0.280	Trout Present Criterion (mg N/L)	8.054	MAX	22.342
7Q10	0.110	N/A	0.210	N/A	Trout Absent Criterion (mg N/L)	12.059	(7.688 - pH)	-0.161
30Q10	0.140	0.310	0.240	0.410	Trout Present?	n	(pH - 7.688)	0.161
30Q5	0.170	N/A	0.270	N/A	Effective Criterion (mg N/L)	12.059	Early LS Present Criterion (mg N/L)	1.806
Harm. Mean	0.450	N/A	0.550	N/A			Early LS Absent Criterion (mg N/L)	1.806
Annual Avg.	0.000	N/A	0.100	N/A			Early Life Stages Present?	y
							Effective Criterion (mg N/L)	1.806
<b><u>Stream/Discharge Mix Values</u></b>					<b><u>Ammonia - Wet Season - Acute</u></b>		<b><u>Ammonia - Wet Season - Chronic</u></b>	
		<b><u>Dry Season</u></b>	<b><u>Wet Season</u></b>		90th Percentile pH (SU)	7.885	90th Percentile Temp. (deg C)	16.585
1Q10 90th% Temp. Mix (deg C)		22.850	16.857		(7.204 - pH)	-0.681	90th Percentile pH (SU)	7.963
30Q10 90th% Temp. Mix (deg C)		22.342	16.585		(pH - 7.204)	0.681	MIN	2.494
1Q10 90th% pH Mix (SU)		7.804	7.885		Trout Present Criterion (mg N/L)	6.953	MAX	16.585
30Q10 90th% pH Mix (SU)		7.849	7.963		Trout Absent Criterion (mg N/L)	10.411	(7.688 - pH)	-0.275
1Q10 10th% pH Mix (SU)		7.255	N/A		Trout Present?	n	(pH - 7.688)	0.275
7Q10 10th% pH Mix (SU)		7.264	N/A		Effective Criterion (mg N/L)	10.411	Early LS Present Criterion (mg N/L)	2.246
		<b><u>Calculated</u></b>	<b><u>Formula Inputs</u></b>				Early LS Absent Criterion (mg N/L)	2.246
1Q10 Hardness (mg/L as CaCO3) =		209.500	209.500				Early Life Stages Present?	y
7Q10 Hardness (mg/L as CaCO3) =		209.429	209.429				Effective Criterion (mg N/L)	2.246



11/27/2012 1:53:15 PM

Facility = Riner WWTP

Chemical = ammonia (mg/L) June - Dec.

Chronic averaging period = 30

WLAa = 6

WLAc = 1.1

Q.L. = 0.2

# samples/mo. = 4

# samples/wk. = 1

#### Summary of Statistics:

# observations = 1

Expected Value = 9

Variance = 29.16

C.V. = 0.6

97th percentile daily values = 21.9007

97th percentile 4 day average = 14.9741

97th percentile 30 day average = 10.8544

# < Q.L. = 0

Model used = BPJ Assumptions, type 2 data

A limit is needed based on Chronic Toxicity

Maximum Daily Limit = 2.21943710275794

Average Weekly limit = 2.21943710275794

Average Monthly Limit = 1.51748623520448

TKN limits predicted  
by DO model

5.4 mg/L monthly ave

8.1 mg/L weekly ave

The data are:

9

ammonia limits

1.52 mg/L

monthly average

2.22 mg/L

weekly average

11/13/2012 11:10:48 AM

Facility = Riner WWTP  
Chemical = ammonia (mg/L) Jan. - May  
Chronic averaging period = 30  
WLAa = 7.3  
WLAc = 2.3  
Q.L. = 0.1  
# samples/mo. = 4  
# samples/wk. = 1

### Summary of Statistics:

# observations = 1  
Expected Value = 9  
Variance = 29.16  
C.V. = 0.6  
97th percentile daily values = 21.9007  
97th percentile 4 day average = 14.9741  
97th percentile 30 day average = 10.8544  
# < Q.L. = 0  
Model used = BPJ Assumptions, type 2 data

A limit is needed based on Chronic Toxicity

Maximum Daily Limit = 4.64064121485751

Average Weekly limit = 4.64064121485752  $\checkmark + 3 = 7.6$  mg/L TKN weekly

Average Monthly Limit = 3.17292576451845  $+ 3 = 6.1$  mg/L TKN monthly

TKN limits 5.4 mg/L  $\checkmark$  monthly  
8.1 mg/L weekly

The data are:

9

most stringent  
limits checked

5.40 mg/L TKN = 2.4 mg/L ammonia

equivalent most stringent TKN limits  
protective of ammonia.

[ 5.4 mg/L monthly average TKN  
7.6 mg/L weekly average TKN ]

12/19/2012 3:45:14 PM

Facility = Riner WWTP  
Chemical = copper, dissolved (ug/L)  
Chronic averaging period = 4  
WLAa = 14  
WLAc = 9.6  
Q.L. = 5  
# samples/mo. = 1  
# samples/wk. = 1

Summary of Statistics:

# observations = 1  
Expected Value = 12  
Variance = 51.84  
C.V. = 0.6  
97th percentile daily values = 29.2010  
97th percentile 4 day average = 19.9654  
97th percentile 30 day average = 14.4726  
# < Q.L. = 0  
Model used = BPJ Assumptions, type 2 data

A limit is needed based on Acute Toxicity  
Maximum Daily Limit = 14  
Average Weekly limit = 14  
Average Monthly Limit = 14

The data are: *Data collected 2008.*

12/19/2012 3:41:21 PM

Facility = Riner WWTP  
Chemical = zinc, dissolved (ug/L)  
Chronic averaging period = 4  
WLAa = 110  
WLAc = 120  
Q.L. = 10  
# samples/mo. = 1  
# samples/wk. = 1

Summary of Statistics:

# observations = 7  
Expected Value = 135.142  
Variance = 6574.89  
C.V. = 0.6  
97th percentile daily values = 328.858  
97th percentile 4 day average = 224.849  
97th percentile 30 day average = 162.989  
# < Q.L. = 0  
Model used = BPJ Assumptions, type 2 data

A limit is needed based on Acute Toxicity  
Maximum Daily Limit = 110  
Average Weekly limit = 110  
Average Monthly Limit = 110

The data are: Data collected 2006-2008

173  
232  
113  
103  
141  
75  
109

11/28/2012 4:34:40 PM

Facility = Riner WWTP  
Chemical = TRC (ug/L)  
Chronic averaging period = 4  
WLAa = 9.5  
WLAc = 5.8  
Q.L. = 20  
# samples/mo. = 90  
# samples/wk. = 23

Summary of Statistics:

# observations = 1  
Expected Value = 1000  
Variance = 360000  
C.V. = 0.6  
97th percentile daily values = 2433.41  
97th percentile 4 day average = 1663.79  
97th percentile 30 day average = 1206.05  
# < Q.L. = 0  
Model used = BPJ Assumptions, type 2 data

A limit is needed based on Chronic Toxicity  
Maximum Daily Limit = 8.48293374750874  
Average Weekly limit = 4.37283028074696  
Average Monthly Limit = 3.9007301011439

0.004 mg/L monthly average  
0.004 mg/L weekly average

The data are:

1000

## **Attachment I**

### **Water Quality Model Calculations**

REGIONAL MODELING SYSTEM    VERSION 4.0  
**Model Input File for the Discharge  
to MILL CREEK.**

**File Information**

File Name: C:\Documents and Settings\pmp94864\My Documents\Working files\BECK  
Date Modified: December 14, 2012

**Water Quality Standards Information**

Stream Name: MILL CREEK  
River Basin: New River Basin  
Section: 2  
Class: IV - Mountainous Zones Waters  
Special Standards: v

**Background Flow Information**

Gauge Used: Mill Creek  
Gauge Drainage Area: 2.12 Sq.Mi.  
Gauge 7Q10 Flow: 0.11 MGD  
Headwater Drainage Area: 2.12 Sq.Mi.  
Headwater 7Q10 Flow: 0.11 MGD (Net; includes Withdrawals/Discharges)  
Withdrawal/Discharges: 0 MGD  
Incremental Flow in Segments: 5.188679E-02 MGD/Sq.Mi.

**Background Water Quality**

Background Temperature: 19.8 Degrees C  
Background cBOD5: 2 mg/l  
Background TKN: 0 mg/l  
Background D.O.: 7.642594 mg/l

**Model Segmentation**

Number of Segments: 2  
Model Start Elevation: 2000 ft above MSL  
Model End Elevation: 1960 ft above MSL

REGIONAL MODELING SYSTEM    VERSION 4.0  
**Model Input File for the Discharge  
to MILL CREEK.**

**Segment Information for Segment 1**

Definition Information

Segment Definition:	A discharge enters.
Discharge Name:	RINER WWTP
VPDES Permit No.:	VA0024040

Discharger Flow Information

Flow:	0.1 MGD
cBOD5:	16 mg/l
TKN:	5 mg/l
D.O.:	6.6 mg/l
Temperature:	25.9 Degrees C

Geographic Information

Segment Length:	1.02 miles
Upstream Drainage Area:	2.12 Sq.Mi.
Downstream Drainage Area:	2.12 Sq.Mi.
Upstream Elevation:	2000 Ft.
Downstream Elevation:	1980 Ft.

Hydraulic Information

Segment Width:	1.55 Ft.
Segment Depth:	0.44 Ft.
Segment Velocity:	0.476 Ft./Sec.
Segment Flow:	0.21 MGD
Incremental Flow:	0 MGD (Applied at end of segment.)

Channel Information

Cross Section:	Irregular
Character:	Severely Meandering
Pool and Riffle:	No
Bottom Type:	Silt
Sludge:	Trace
Plants:	None
Algae:	None



REGIONAL MODELING SYSTEM    VERSION 4.0  
Model Input File for the Discharge  
to MILL CREEK.

**Segment Information for Segment 2**

Definition Information

Segment Definition:                    A tributary enters.  
Tributary Name:                        UNNAMED TRIBUTARY

Tributary Flow Information

Flow:                                    0.3 MGD  
cBOD5:                                  2 mg/l  
TKN:                                     0 mg/l  
D.O.:                                    7.651 mg/l  
Temperature:                          19.8 Degrees C

Geographic Information

Segment Length:                      0.5 miles  
Upstream Drainage Area:              2.12 Sq.Mi.  
Downstream Drainage Area:          2.12 Sq.Mi.  
Upstream Elevation:                  1980 Ft.  
Downstream Elevation:                1960 Ft.

Hydraulic Information

Segment Width:                        1.55 Ft.  
Segment Depth:                        0.488 Ft.  
Segment Velocity:                      0.891 Ft./Sec.  
Segment Flow:                         0.51 MGD  
Incremental Flow:                      0 MGD (Applied at end of segment.)

Channel Information

Cross Section:                         Irregular  
Character:                                Moderately Meandering  
Pool and Riffle:                        No  
Bottom Type:                            Silt  
Sludge:                                    Trace  
Plants:                                    None  
Algae:                                     None

Jan-May

"\*\*\*SEASONAL RUN\*\*\*"

"Wet Season is from January to May."

"Model Run For C:\Documents and Settings\pmp94864\My Documents\working  
 files\BECKY\PERMITS\VPDES\Riner WWTP\Reissuance 2008\Data\rinermode1 trial 2008 5.0  
 TKN bod 20 final. 2012mod.mod On 12/14/2012 8:49:41 AM"

"Model is for MILL CREEK."

"Model starts at the RINER WWTP discharge."

"Background Data"

"Flow"	"CBOD5"	"TKN"	"DO"	"Temp"
"(mgd)"	"(mg/l)"	"(mg/l)"	"(mg/l)"	"deg C"
.22,	2,	0,	8.244,	16

"Discharge/Tributary Input Data for Segment 1"

"Flow"	"CBOD5"	"TKN"	"DO"	"Temp"
"(mgd)"	"(mg/l)"	"(mg/l)"	"(mg/l)"	"deg C"
.1,	19,	5,	7,	18.4

"Hydraulic Information for Segment 1"

"Length"	"width"	"Depth"	"velocity"
"(mi)"	"(ft)"	"(ft)"	"(ft/sec)"
1.02,	1.55,	.6522041,	.4897795

"Initial Mix Values for Segment 1"

"Flow"	"DO"	"CBOD"	"nBOD"	"DOSat"	"Temp"
"(mgd)"	"(mg/l)"	"(mg/l)"	"(mg/l)"	"(mg/l)"	"deg C"
.32,	7.855,	18.281,	2.706,	9.022,	16.75

"Rate Constants for Segment 1. - (All units Per Day)"

"k1"	"k1@T"	"k2"	"k2@T"	"kn"	"kn@T"	"BD"	"BD@T"
.7,	.603,	11.765,	10.892,	.15,	.117,	.2515194,	.196

"Output for Segment 1"

"Segment starts at RINER WWTP"

"Total"	"Segm."	"Dist."	"DO"	"CBOD"	"nBOD"
"(mi)"	"(mi)"	"(mi)"	"(mg/l)"	"(mg/l)"	"(mg/l)"
0,	0,	0,	7.855,	18.281,	2.706
.1,	.1,	.1,	7.869,	18.144,	2.702
.2,	.2,	.2,	7.882,	18.008,	2.698
.3,	.3,	.3,	7.895,	17.873,	2.694
.4,	.4,	.4,	7.907,	17.739,	2.69
.5,	.5,	.5,	7.918,	17.606,	2.686
.6,	.6,	.6,	7.929,	17.474,	2.682
.7,	.7,	.7,	7.939,	17.343,	2.678
.8,	.8,	.8,	7.949,	17.213,	2.674
.9,	.9,	.9,	7.959,	17.084,	2.67
1,	1,	1,	7.968,	16.956,	2.666
1.02,	1.02,	1.02,	7.97,	16.931,	2.665

"Discharge/Tributary Input Data for Segment 2"

"Flow"	"CBOD5"	"TKN"	"DO"	"Temp"
"(mgd)"	"(mg/l)"	"(mg/l)"	"(mg/l)"	"deg C"
.6,	2,	0,	8.253,	16

"Incremental Flow Input Data for Segment 2"

"Flow"	"CBOD5"	"TKN"	"DO"	"Temp"
"(mgd)"	"(mg/l)"	"(mg/l)"	"(mg/l)"	"deg C"

```

0,      2,      0,      ,8.208, 16      modout.txt
"Hydraulic Information for Segment 2"
"Length", "width", "Depth", "Velocity"
"(mi)", "(ft)", "(ft)", "(ft/sec)"
.5,      1.55,      .7233536, 1.269613

"Initial Mix Values for Segment 2"
"Flow", "DO", "CBOD", "nBOD", "DOSat", "Temp"
"(mgd)", "(mg/l)", "(mg/l)", "(mg/l)", "(mg/l)", "deg C"
.92,      8.155,      9.15,      .927,      9.12,      16.26087

"Rate Constants for Segment 2. - (All units Per Day)"
"k1", "k1@T", "k2", "k2@T", "kn", "kn@T", "BD", "BD@T"
1,      .842,      20,      18.303, .35,      .262,      .2267798,
.17

"Output for Segment 2"
"Segment starts at UNNAMED TRIBUTARY"
"Total", "Segm."
"Dist.", "Dist.", "DO", "CBOD", "nBOD"
"(mi)", "(mi)", "(mg/l)", "(mg/l)", "(mg/l)"
1.02,      0,      8.155,      9.15,      .927
1.12,      .1,      8.199,      9.113,      .926
1.22,      .2,      8.208,      9.076,      .925
1.32,      .3,      8.208,      9.039,      .924
1.42,      .4,      8.208,      9.002,      .923
1.52,      .5,      8.208,      8.966,      .922

"END OF FILE"

```

modout Riner WWTP low flow 2012.txt

"Model Run For C:\Documents and Settings\pmp94864\My Documents\working files\BECKY\PERMITS\VPDES\Riner WWTP\Reissuance 2008\Data\rinermmodel trial 2008 5.0 TKN bod 20 final. 2012mod.mod On 12/14/2012 8:46:39 AM"

"Model is for MILL CREEK."

"Model starts at the RINER WWTP discharge."

June-Dec

"Background Data"

"Flow"	"CBOD5"	"TKN"	"DO"	"Temp"
"(mgd)"	"(mg/l)"	"(mg/l)"	"(mg/l)"	"deg C"
.11,	2,	0,	7.643,	19.8

"Discharge/Tributary Input Data for Segment 1"

"Flow"	"CBOD5"	"TKN"	"DO"	"Temp"
"(mgd)"	"(mg/l)"	"(mg/l)"	"(mg/l)"	"deg C"
.1,	16,	5,	6.6,	25.9

 ✓

"Hydraulic Information for Segment 1"

"Length"	"width"	"Depth"	"Velocity"
"(mi)"	"(ft)"	"(ft)"	"(ft/sec)"
1.02,	1.55,	.44,	.476

"Initial Mix Values for Segment 1"

"Flow"	"DO"	"CBOD"	"nBOD"	"DOSat"	"Temp"
"(mgd)"	"(mg/l)"	"(mg/l)"	"(mg/l)"	"(mg/l)"	"deg C"
.21,	7.146,	21.667,	4.124,	8.06,	22.70476

"Rate Constants for Segment 1. - (All units Per Day)"

"k1"	"k1@T"	"k2"	"k2@T"	"kn"	"kn@T"	"BD"	"BD@T"
1.4,	1.585,	11.765,	12.544,	.35,	.431,	.3728227,	.459

"Output for Segment 1"

"Segment starts at RINER WWTP"

"Total"	"Segm."	"Dist."	"Dist."	"DO"	"CBOD"	"nBOD"
"(mi)"	"(mi)"	"(mi)"	"(mi)"	"(mg/l)"	"(mg/l)"	"(mg/l)"
0,	0,	0,	0,	7.146,	21.667,	4.124
.1,	.1,	.1,	.1,	6.852,	21.231,	4.101
.2,	.2,	.2,	.2,	6.61,	20.803,	4.078
.3,	.3,	.3,	.3,	6.412,	20.384,	4.055
.4,	.4,	.4,	.4,	6.252,	19.973,	4.033
.5,	.5,	.5,	.5,	6.123,	19.571,	4.011
.6,	.6,	.6,	.6,	6.021,	19.177,	3.989
.7,	.7,	.7,	.7,	5.942,	18.791,	3.967
.8,	.8,	.8,	.8,	5.882,	18.412,	3.945
.9,	.9,	.9,	.9,	5.838,	18.041,	3.923
1,	1,	1,	1,	5.807,	17.678,	3.901
1.02,	1.02,	1.02,	1.02,	5.802,	17.606,	3.897

"Discharge/Tributary Input Data for Segment 2"

"Flow"	"CBOD5"	"TKN"	"DO"	"Temp"
"(mgd)"	"(mg/l)"	"(mg/l)"	"(mg/l)"	"deg C"
.3,	2,	0,	7.651,	19.8

"Incremental Flow Input Data for Segment 2"

"Flow"	"CBOD5"	"TKN"	"DO"	"Temp"
"(mgd)"	"(mg/l)"	"(mg/l)"	"(mg/l)"	"deg C"
0,	2,	0,	7.483,	19.8

"Hydraulic Information for Segment 2"

"Length", "Width", "Depth", "Velocity"  
 "(mi)", "(ft)", "(ft)", "(ft/sec)"  
 .5, 1.55, .488, .891

"Initial Mix Values for Segment 2"

"Flow", "DO", "CBOD", "nBOD", "DOSat", "Temp"  
 "(mgd)", "(mg/l)", "(mg/l)", "(mg/l)", "(mg/l)", "deg C"  
 .51, 6.89, 10.191, 1.605, 8.315, 20.99608

"Rate Constants for Segment 2. - (All units Per Day)"

"k1", "k1@T", "k2", "k2@T", "kn", "kn@T", "BD", "BD@T"  
 1.2, 1.256, 20, 20.478, .35, .378, .3361516, .363

"Output for Segment 2"

"Segment starts at UNNAMED TRIBUTARY"

"Total", "Segm."	"Dist.", "Dist."	"DO", "DO"	"CBOD", "CBOD"	"nBOD", "nBOD"
"(mi)", "(mi)"	"(mi)", "(mi)"	"(mg/l)", "(mg/l)"	"(mg/l)", "(mg/l)"	"(mg/l)", "(mg/l)"
1.02, 0,	6.89,	10.191,	1.605	
1.12, .1,	6.989,	10.104,	1.601	
1.22, .2,	7.076,	10.017,	1.597	
1.32, .3,	7.152,	9.931,	1.593	
1.42, .4,	7.219,	9.846,	1.589	
1.52, .5,	7.278,	9.762,	1.585	

"END OF FILE"

modout.txt

"Model Run For C:\Documents and Settings\pmp94864\My Documents\working  
files\BECKY\PERMITS\VPDES\Riner WWTP\Reissuance 2008\Data\rinermmodel trial 2008 5.0  
TKN bod 20 final. 2012mod.mod On 12/13/2012 3:42:02 PM"

"Model is for MILL CREEK."

"Model starts at the RINER WWTP discharge."

*June-Dec.  
violates*

"Background Data"

"Flow"	"cBOD5"	"TKN"	"DO"	"Temp"
"(mgd)"	"(mg/l)"	"(mg/l)"	"(mg/l)"	"deg C"
.11,	2,	0,	7.643,	19.8

"Discharge/Tributary Input Data for Segment 1"

"Flow"	"cBOD5"	"TKN"	"DO"	"Temp"
"(mgd)"	"(mg/l)"	"(mg/l)"	"(mg/l)"	"deg C"
.1,	16,	5,	6.5,	25.9

"Hydraulic Information for Segment 1"

"Length"	"width"	"Depth"	"Velocity"
"(mi)"	"(ft)"	"(ft)"	"(ft/sec)"
1.02,	1.55,	.44,	.476

"Initial Mix Values for Segment 1"

"Flow"	"DO"	"cBOD"	"nBOD"	"DOSat"	"Temp"
"(mgd)"	"(mg/l)"	"(mg/l)"	"(mg/l)"	"(mg/l)"	"deg C"
.21,	7.099,	21.667,	4.124,	8.06,	22.70476

"Rate Constants for Segment 1. - (All units Per Day)"

"k1"	"k1@T"	"k2"	"k2@T"	"kn"	"kn@T"	"BD"	"BD@T"
1.4,	1.585,	11.765,	12.544,	.35,	.431,	.3728227,	.459

"Output for Segment 1"

"Segment starts at RINER WWTP"

"Total"	"Segm."	"Dist."	"Dist."	"DO"	"cBOD"	"nBOD"
"(mi)"	"(mi)"	"(mi)"	"(mi)"	"(mg/l)"	"(mg/l)"	"(mg/l)"
0,	0,	0,	0,	7.099,	21.667,	4.124
.1,	.1,	.1,	.1,	6.812,	21.231,	4.101
.2,	.2,	.2,	.2,	6.576,	20.803,	4.078
.3,	.3,	.3,	.3,	6.383,	20.384,	4.055
.4,	.4,	.4,	.4,	6.227,	19.973,	4.033
.5,	.5,	.5,	.5,	6.102,	19.571,	4.011
.6,	.6,	.6,	.6,	6.003,	19.177,	3.989
.7,	.7,	.7,	.7,	5.926,	18.791,	3.967
.8,	.8,	.8,	.8,	5.868,	18.412,	3.945
.9,	.9,	.9,	.9,	5.826,	18.041,	3.923
1,	1,	1,	1,	5.797,	17.678,	3.901
1.02,	1.02,	1.02,	1.02,	5.793,	17.606,	3.897

"Discharge/Tributary Input Data for Segment 2"

"Flow"	"cBOD5"	"TKN"	"DO"	"Temp"
"(mgd)"	"(mg/l)"	"(mg/l)"	"(mg/l)"	"deg C"
.3,	2,	0,	7.651,	19.8

"Incremental Flow Input Data for Segment 2"

"Flow"	"cBOD5"	"TKN"	"DO"	"Temp"
"(mgd)"	"(mg/l)"	"(mg/l)"	"(mg/l)"	"deg C"
0,	2,	0,	7.483,	19.8

## "Hydraulic Information for Segment 2"

"Length", "width", "Depth", "Velocity"  
 "(mi)", "(ft)", "(ft)", "(ft/sec)"  
 .5, 1.55, .488, .891

## "Initial Mix Values for Segment 2"

"Flow", "DO", "cBOD", "nBOD", "DOSat", "Temp"  
 "(mgd)", "(mg/l)", "(mg/l)", "(mg/l)", "(mg/l)", "deg C"  
 .51, 6.886, 10.191, 1.605, 8.315, 20.99608

## "Rate Constants for Segment 2. - (All units Per Day)"

"k1", "k1@T", "k2", "k2@T", "kn", "kn@T", "BD", "BD@T"  
 1.2, 1.256, 20, 20.478, .35, .378, .3361516, .363

## "Output for Segment 2"

"Segment starts at UNNAMED TRIBUTARY"

"Total", "Segm."

"Dist.", "Dist.", "DO", "cBOD", "nBOD"  
 "(mi)", "(mi)", "(mg/l)", "(mg/l)", "(mg/l)"  
 1.02, 0, 6.886, 10.191, 1.605  
 1.12, .1, 6.985, 10.104, 1.601  
 1.22, .2, 7.072, 10.017, 1.597  
 1.32, .3, 7.148, 9.931, 1.593  
 1.42, .4, 7.215, 9.846, 1.589  
 1.52, .5, 7.274, 9.762, 1.585

"END OF FILE"

modout.txt

"Model Run For C:\Documents and Settings\pmp94864\My Documents\Working files\BECKY\PERMITS\VPDES\Riner WWTP\Reissuance 2008\Data\rinermmodel trial 2008 5.0 TKN bod 20 final. 2012mod.mod On 12/18/2012 10:49:57 AM"

"Model is for MILL CREEK."

"Model starts at the RINER WWTP discharge."

"Background Data"

"Flow"	"CBOD5"	"TKN"	"DO"	"Temp"
"(mgd)"	"(mg/l)"	"(mg/l)"	"(mg/l)"	"deg C"
.11,	2,	0,	7.643,	19.8

*June Dec*

"Discharge/Tributary Input Data for Segment 1"

"Flow"	"CBOD5"	"TKN"	"DO"	"Temp"
"(mgd)"	"(mg/l)"	"(mg/l)"	"(mg/l)"	"deg C"
.1,	17,	5,	7,	25.9

"Hydraulic Information for Segment 1"

"Length"	"width"	"Depth"	"velocity"
"(mi)"	"(ft)"	"(ft)"	"(ft/sec)"
1.02,	1.55,	.44,	.476

*Violates*

"Initial Mix Values for Segment 1"

"Flow"	"DO"	"CBOD"	"nBOD"	"DOSat"	"Temp"
"(mgd)"	"(mg/l)"	"(mg/l)"	"(mg/l)"	"(mg/l)"	"deg C"
.21,	7.254,	22.857,	4.124,	8.06,	22.70476

"Rate Constants for Segment 1. - (All units Per Day)"

"k1"	"k1@T"	"k2"	"k2@T"	"kn"	"kn@T"	"BD"	"BD@T"
1.4,	1.585,	11.765,	12.544,	.35,	.431,	.3728227,	.459

"Output for Segment 1"

"Segment starts at RINER WWTP"

"Total"	"Segm."	"Dist."	"Dist."	"DO"	"CBOD"	"nBOD"
"(mi)"	"(mi)"	"(mi)"	"(mi)"	"(mg/l)"	"(mg/l)"	"(mg/l)"
0,	0,	7.254,	22.857,	4.124		
.1,	.1,	6.922,	22.397,	4.101		
.2,	.2,	6.648,	21.946,	4.078		
.3,	.3,	6.423,	21.504,	4.055		
.4,	.4,	6.24,	21.071,	4.033		
.5,	.5,	6.093,	20.647,	4.011		
.6,	.6,	5.976,	20.231,	3.989		
.7,	.7,	5.884,	19.823,	3.967		
.8,	.8,	5.813,	19.424,	3.945		
.9,	.9,	5.76,	19.033,	3.923		
1,	1,	5.723,	18.65,	3.901		
1.02,	1.02,	5.717,	18.574,	3.897		

"Discharge/Tributary Input Data for Segment 2"

"Flow"	"CBOD5"	"TKN"	"DO"	"Temp"
"(mgd)"	"(mg/l)"	"(mg/l)"	"(mg/l)"	"deg C"
.3,	2,	0,	7.651,	19.8

"Incremental Flow Input Data for Segment 2"

"Flow"	"CBOD5"	"TKN"	"DO"	"Temp"
"(mgd)"	"(mg/l)"	"(mg/l)"	"(mg/l)"	"deg C"
0,	2,	0,	7.483,	19.8



modout.txt

"Hydraulic Information for Segment 2"

"Length", "width", "Depth", "Velocity"  
"(mi)", "(ft)", "(ft)", "(ft/sec)"  
.5, 1.55, .488, .891

"Initial Mix Values for Segment 2"

"Flow", "DO", "CBOD", "nBOD", "DOSat", "Temp"  
"(mgd)", "(mg/l)", "(mg/l)", "(mg/l)", "(mg/l)", "deg C"  
.51, 6.855, 10.589, 1.605, 8.315, 20.99608

"Rate Constants for Segment 2. - (All units Per Day)"

"k1", "k1@T", "k2", "k2@T", "kn", "kn@T", "BD", "BD@T"  
1.2, 1.256, 20, 20.478, .35, .378, .3361516, .363

"Output for Segment 2"

"Segment starts at UNNAMED TRIBUTARY"

"Total", "Segm."

"Dist."	"Dist."	"DO"	"CBOD"	"nBOD"
"(mi)"	"(mi)"	"(mg/l)"	"(mg/l)"	"(mg/l)"
1.02,	0,	6.855,	10.589,	1.605
1.12,	.1,	6.955,	10.498,	1.601
1.22,	.2,	7.043,	10.408,	1.597
1.32,	.3,	7.12,	10.319,	1.593
1.42,	.4,	7.188,	10.23,	1.589
1.52,	.5,	7.248,	10.142,	1.585

"END OF FILE"

## **Attachment J**

### **Public Notice and Comments**

## PUBLIC NOTICE – Environmental Permit

**PURPOSE OF NOTICE:** To seek public comment on a draft permit from the Department of Environmental Quality that will allow the release of treated wastewater into a water body in Montgomery County, Virginia

**PUBLIC COMMENT PERIOD:** December 23, 2012 through January 21, 2013 at 4:30 pm

**PERMIT NAME:** Virginia Pollutant Discharge Elimination System Permit – Wastewater issued by DEQ, under the authority of the State Water Control Board

**APPLICANT NAME, ADDRESS, AND PERMIT NUMBER:** Montgomery County Public Service Authority, 755 Roanoke Street, Suite 2-I, Christiansburg, VA 24073, VA0024040

**FACILITY NAME AND LOCATION:** Riner WWTP, 4351 Riner Road, Riner, Virginia 24149

**PROJECT DESCRIPTION:** Montgomery County Public Service Authority has applied for a reissuance of a permit for the wastewater treatment plant in Montgomery County. The applicant proposes to release treated sewage wastewater from residential areas at a rate of 100,000 gallons per day from the current facility into a water body. Dewatered sludge from the treatment process will be transported to the Shawsville WWTP for further treatment. The facility proposes to release the treated sewage to Mill Creek in Montgomery County in the Little River/Indian Creek/Brush Creek Watershed (VAW-N21R). A watershed is the land area drained by a river and its incoming streams. The permit will limit the following pollutants to amounts that protect water quality: nutrients, organic matter, solids, toxic pollutants

**HOW TO COMMENT AND/OR REQUEST A PUBLIC HEARING:** DEQ accepts comments and requests for public hearing by e-mail, fax, or postal mail. All comments and requests must be in writing and be received by DEQ during the comment period. Submittals must include the names, mailing addresses and telephone numbers of the commenter/requester and of all persons represented by the commenter/requester. A request for a public hearing must also include: 1) The reason why a public hearing is requested. 2) A brief, informal statement regarding the nature and extent of the interest of the requester or of those represented by the requestor, including how and extent such interest would be directly and adversely affected by the permit. 3) Specific references, where possible, to terms and conditions of the permit with suggested revisions. A public hearing may be held, including another comment period, if a public response is significant, based on individual requests for a public hearing, and there are substantial, disputed issues relevant to the permit.

**CONTACT FOR PUBLIC COMMENTS, DOCUMENT REQUESTS, AND ADDITIONAL INFORMATION:**

Becky L. France; ADDRESS: Virginia Department of Environmental Quality, Blue Ridge Regional Office, 3019 Peters Creek Road, Roanoke, VA 24019-2738; (540) 562-6700; E-MAIL ADDRESS: [becky.france@deq.virginia.gov](mailto:becky.france@deq.virginia.gov); FAX: (540) 562-6725. The public may review the draft permit and application at the DEQ office named above (by appointment) or may request copies of the documents from the contact person listed above.

## France, Becky (DEQ)

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**From:** France, Becky (DEQ)  
**Sent:** Wednesday, January 16, 2013 4:42 PM  
**To:** 'Bob Fronk'  
**Subject:** RE: Draft Permit and Fact Sheet for Riner WWTP

I have revised the Part I.C special condition to remove reference to weekly samples. The new language refers to criteria of four or more samples in a month. In the event that four or more samples are collected during the month the maximum limit will be applicable.

---

**From:** Bob Fronk [mailto:fronkrc@montgomerycountyva.gov]  
**Sent:** Friday, January 11, 2013 1:34 PM  
**To:** France, Becky (DEQ)  
**Subject:** RE: Draft Permit and Fact Sheet for Riner WWTP

Becky:

I think you are missing the point on the first issue. It is not if we only collect 3 samples; it's if we only collect samples in three weeks. We could easily collect more than 3 samples. Using the previous discussion on significant digits, 10% of 5 and most certainly 6 samples would yield one sample that would meet the 10% excursion rate. This makes it meaningful to include especially since this criteria is included in 9VAC25-260-170.

I'll ask that you reconsider per this condition. As you point out, anything less than 5 samples will yield a "0" sample exclusion.

Robert C. Fronk, PE  
PSA Director  
Montgomery County Public Service Authority  
755 Roanoke Street, Suite 2-1  
Christiansburg, VA 24073  
ph: 540-381-1997

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**From:** France, Becky (DEQ) [mailto:Becky.France@deq.virginia.gov]  
**Sent:** Friday, January 11, 2013 9:53 AM  
**To:** Bob Fronk  
**Subject:** RE: Draft Permit and Fact Sheet for Riner WWTP

I have reviewed your comments for the draft Riner STP permit.

The first comment regarded the request to include a 10% excursion rate to the *E. coli* maximum limit. The 235 cfu/100 mL is applicable when fewer than 4 samples are taken during a month. Using your logic, 10% of 3 would be rounded down to 0. Note that we are not applying the maximum limit when more than 3 samples are collected. The assessment period for this DMR is a month. So, a 10% excursion rate would not be meaningful for this maximum limit. Therefore, no change is necessary for the criteria for the limit applicability (Part I.C).

Your second comment requested that in the event that fewer than 4 *E. coli* samples are collected, an explanation should not be required. For the type and size of this treatment facility it seems unlikely that the facility would be unable to collect 4 samples in one month. There could be an economic benefit to a facility that collects and analyzes 3 samples for *E. coli* instead of 4 and the intent is for the facility to collect one sample each week to demonstrate adequate disinfection and compliance with the 126 cfu/100 mL geometric mean limit. In the event that four samples are not collected in a month, it is reasonable to require an explanation as to why these sample(s) could not be collected.

Documenting deviations from standard procedures and significant problems is not outside of normal practices expected from a wastewater treatment facility. Therefore, this requirement has not been changed in the permit.

---

**From:** Bob Fronk [<mailto:fronkrc@montgomerycountyva.gov>]  
**Sent:** Friday, January 11, 2013 8:49 AM  
**To:** France, Becky (DEQ)  
**Subject:** FW: Draft Permit and Fact Sheet for Riner WWTP

Hello Becky:

I wanted to forward the response from the reviewing attorney relative to the draft Riner STP permit. We waited till after additional reviews by various staff before forwarding this to you in case we had additional comments; which we don't.

Please review and let me know what you think.

Thanks

bob

Robert C. Fronk, PE  
PSA Director  
Montgomery County Public Service Authority  
755 Roanoke Street, Suite 2-I  
Christiansburg, VA 24073  
ph: 540-381-1997

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**From:** Ochsenhirt, Lisa [<mailto:lisa@aqualaw.com>]  
**Sent:** Monday, December 17, 2012 5:28 PM  
**To:** Bob Fronk  
**Cc:** Sedgley, Dick  
**Subject:** Draft Permit and Fact Sheet for Riner WWTP

Bob-

It was good to talk with you again this afternoon. As we discussed, I suggest reaching out to Becky regarding the expression of your limits and monitoring requirements on E. coli.

The criteria for bacteria is found at 9VAC25-260-170. For freshwater, E. coli cannot exceed 126 CFU/100 ml when calculated based on a geometric mean (only permitted if you have a minimum of four weekly samples). If you are unable to collect the minimum number of samples, no more than 10% of the total samples collected during the month can exceed a single sample maximum of 235 CFU/100 ml. Based on the standard, I would recommend asking DEQ to make a change to the Draft Permit on the limitations page (Part I, p. 1). Footnote 4 currently states that the maximum limit is applicable if "fewer than 4 samples collected." Given the 10% excursion rate, I would suggest this be changed to "Maximum limit applicable if fewer than 4 weekly samples collected and more than 10% of samples exceed the limit above."

In addition, under the E. coli monitoring requirements (Part I, p. 2), you may wish to consider asking DEQ to delete the last part of paragraph 2: "... and provide an explanation why four weekly samples were not collected." The water quality standards regulations allow an operator to collect fewer samples than necessary to calculate the monthly geometric mean (although the operator must then live with the SSM). I disagree with the suggestion that an explanation for why fewer samples were collected is needed, although I understand from our conversation that you would likely provide the explanation anyway if you find yourself in this unusual situation.

Of the two issues, the first is more important.

I look forward to meeting you in person sometime next year at a VAMWA Quarterly Meeting.

Best wishes for a happy holiday-

Lisa

Lisa M. Ochsenhirt

Attorney

**AQUALAW**

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**From:** Ochsenhirt, Lisa

**Sent:** Tuesday, December 11, 2012 3:51 PM

**To:** [fronkrc@montgomerycountyyva.gov](mailto:fronkrc@montgomerycountyyva.gov)

**Subject:** Draft Permit and Fact Sheet for Riner WWTP

Bob-

Per your request and, as is our custom with VAMWA Members, we have performed a high-level review of the draft permit reissuance package for the Riner WWTP. Issues of note from this initial review include:

- **Significant Figures** -- DEQ's use of three significant figures for pH "to provide more accurate 90<sup>th</sup> percentile pH data analysis calculations for the permit reissuance" is inappropriate given that the state's numeric water quality standards for pH (9VAC25-260-50) are expressed as two significant figures. I recommend that you raise this issue with DEQ, and ask that they make appropriate edits to the draft Fact Sheet and the draft Permit.
- **Changes to BOD<sub>5</sub> limit** – Table III of the draft Fact Sheet notes that Riner's BOD<sub>5</sub> limit is decreasing from 19 mg/L monthly average, 28 mg/L weekly average to 16 and 24, respectively. This is the result of modeling DEQ performed that identifies limits for BOD<sub>5</sub>, TKN, and DO based on certain inputs (ex., temperature and flow). Generally, we have found the modeling process to be sound in concept. However, more pragmatically, the question is whether Riner can meet the adjusted limits. I see, for example, that the plant did have an issue with BOD<sub>5</sub> during the last permit cycle. If you are concerned about BOD<sub>5</sub>, TKN, or DO, you could approach DEQ about re-running the model using a different mix of assumptions. What is your reaction to the limits based on the plant's capabilities?

In addition, as noted in Becky France's e-mail, DEQ has included a permit term of less than 5 years for Riner. This is unusual. It is likely not a significant financial issue given the size of the plant, but you may wish to ask her how they will handle the shorter term for purposes of any associated fees (if you have not done so already).

If you have any follow-up questions, we would be glad to discuss them at your convenience. In addition, as noted above, we performed a high-level review per your VAMWA Membership. To the extent you have particular concerns you would like us to delve into in greater detail, or if we could be of assistance during your negotiations with DEQ on an individual basis, we would be happy to work with you on behalf of the PSA.

Best Regards-

Lisa

Lisa M. Ochsenhirt

Attorney

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**From:** Bob Fronk [<mailto:fronkrc@montgomerycountyva.gov>]

**Sent:** Wednesday, December 05, 2012 8:47 AM

**To:** Kelly Carr

**Subject:** FW: Draft Permit and Fact Sheet for Riner WWTP

Dear Kelly:

I previously sent this to Natasha without reply.

Please address this request and confirm receipt.

Thanks

bob

Robert C. Fronk, PE

PSA Director

Montgomery County Public Service Authority

755 Roanoke Street, Suite 2-I

Christiansburg, VA 24073

ph: 540-381-1997

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**From:** Bob Fronk

**Sent:** Friday, November 30, 2012 1:08 PM

**To:** 'Holcomb, Natasha'

**Subject:** FW: Draft Permit and Fact Sheet for Riner WWTP

Dear Natasha:

Attached are document relative to the proposed permit for our Riner WWTP. It is my understanding that as a member of VAMWA that you will perform technical and legal reviews of proposed permits. Please confirm that this is correct. If so, please contact me if you have questions or comments.

Thanks

bob

Robert C. Fronk, PE

PSA Director

Montgomery County Public Service Authority

755 Roanoke Street, Suite 2-I

Christiansburg, VA 24073

ph: 540-381-1997

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**From:** France, Becky (DEQ) [<mailto:Becky.France@deq.virginia.gov>]

**Sent:** Friday, November 30, 2012 11:16 AM

**To:** Richard W. Burton; Bob Fronk; Robert M. Stull

**Subject:** Draft Permit and Fact Sheet for Riner WWTP

**Attachment K**

**EPA Checksheet**



**State "FY2003 Transmittal Checklist" to Assist in Targeting  
Municipal and Industrial Individual NPDES Draft Permits for Review**

**Part I. State Draft Permit Submission Checklist**

In accordance with the MOA established between the Commonwealth of Virginia and the United States Environmental Protection Agency, Region III, the Commonwealth submits the following draft National Pollutant Discharge Elimination System (NPDES) permit for Agency review and concurrence.

Facility Name: Riner WWTP

NPDES Permit Number: VA0024040

Permit Writer Name: Becky L. France

Date: 10/12/12 (Revised 11/28/12)

Major ☐Minor ☒Industrial ☐Municipal ☒

**I.A. Draft Permit Package Submittal Includes:**

	Yes	No	N/A
1. Permit Application?	X		
2. Complete Draft Permit (for renewal or first time permit – entire permit, including boilerplate information)?	X		
3. Copy of Public Notice?	X		
4. Complete Fact Sheet?	X		
5. A Priority Pollutant Screening to determine parameters of concern?	X		
6. A Reasonable Potential analysis showing calculated WQBELs?	X		
7. Dissolved Oxygen calculations?	X		
8. Whole Effluent Toxicity Test summary and analysis?			X
9. Permit Rating Sheet for new or modified industrial facilities?			X

**I.B. Permit/Facility Characteristics**

	Yes	No	N/A
1. Is this a new, or currently unpermitted facility?		X	
2. Are all permissible outfalls (including combined sewer overflow points, non-process water and storm water) from the facility properly identified and authorized in the permit?	X		
3. Does the fact sheet or permit contain a description of the wastewater treatment process?	X		

I.B. Permit/Facility Characteristics – cont. (FY2003)	Yes	No	N/A
4. Does the review of PCS/DMR data for at least the last 3 years indicate significant non-compliance with the existing permit?		X	
5. Has there been any change in streamflow characteristics since the last permit was developed?		X	
6. Does the permit allow the discharge of new or increased loadings of any pollutants?		X	
7. Does the fact sheet or permit provide a description of the receiving water body(s) to which the facility discharges, including information on low/critical flow conditions and designated/existing uses?	X		
8. Does the facility discharge to a 303(d) listed water? bacteria	X		
a. Has a TMDL been developed and approved by EPA for the impaired water?	X		
b. Does the record indicate that the TMDL development is on the State priority list and will most likely be developed within the life of the permit?			X
c. Does the facility discharge a pollutant of concern identified in the TMDL or 303(d) listed water?	X		
9. Have any limits been removed, or are any limits less stringent, than those in the current permit? Backsliding allowed due to new information		X	
10. Does the permit authorize discharges of storm water?			X
11. Has the facility substantially enlarged or altered its operation or substantially increased its flow or production?		X	
12. Are there any production-based, technology-based effluent limits in the permit?		X	
13. Do any water quality-based effluent limit calculations differ from the State's standard policies or procedures?		X	
14. Are any WQBELs based on an interpretation of narrative criteria?		X	
15. Does the permit incorporate any variances or other exceptions to the State's standards or regulations?		X	
16. Does the permit contain a compliance schedule for any limit or condition?		X	
17. Is there a potential impact to endangered/threatened species or their habitat by the facility's discharge(s)?		X	
18. Have impacts from the discharge(s) at downstream potable water supplies been evaluated?			X
19. Is there any indication that there is significant public interest in the permit action proposed for this facility?		X	
20. Have previous permit, application, and fact sheet been examined?	X		

## Part II. NPDES Draft Permit Checklist (FY2003)

### Region III NPDES Permit Quality Checklist – for POTWs (To be completed and included in the record only for POTWs)

#### II.A. Permit Cover Page/Administration

	Yes	No	N/A
1. Does the fact sheet or permit describe the physical location of the facility, including latitude and longitude (not necessarily on permit cover page)?	X		
2. Does the permit contain specific authorization-to-discharge information (from where to where, by whom)?	X		

#### II.B. Effluent Limits – General Elements

	Yes	No	N/A
1. Does the fact sheet describe the basis of final limits in the permit (e.g., that a comparison of technology and water quality-based limits was performed, and the most stringent limit selected)?	X		
2. Does the fact sheet discuss whether “antibacksliding” provisions were met for any limits that are less stringent than those in the previous NPDES permit?	X		

#### II.C. Technology-Based Effluent Limits (POTWs)

	Yes	No	N/A
1. Does the permit contain numeric limits for <u>ALL</u> of the following: BOD (or alternative, e.g., CBOD, COD, TOC), TSS, and pH?	X		
2. Does the permit require at least 85% removal for BOD (or BOD alternative) and TSS (or 65% for equivalent to secondary) consistent with 40 CFR Part 133?	X		
a. If no, does the record indicate that application of WQBELs, or some other means, results in more stringent requirements than 85% removal or that an exception consistent with 40 CFR 133.103 has been approved?			X
3. Are technology-based permit limits expressed in the appropriate units of measure (e.g., concentration, mass, SU)?	X		
4. Are permit limits for BOD and TSS expressed in terms of both long term (e.g., average monthly) and short term (e.g., average weekly) limits?	X		
5. Are any concentration limitations in the permit less stringent than the secondary treatment requirements (30 mg/l BOD5 and TSS for a 30-day average and 45 mg/l BOD5 and TSS for a 7-day average)?		X	
a. If yes, does the record provide a justification (e.g., waste stabilization pond, trickling filter, etc.) for the alternate limitations?			X

#### II.D. Water Quality-Based Effluent Limits

	Yes	No	N/A
1. Does the permit include appropriate limitations consistent with 40 CFR 122.44(d) covering State narrative and numeric criteria for water quality?	X		
2. Does the fact sheet indicate that any WQBELs were derived from a completed and EPA approved TMDL? (E. coli)	X		

<b>II.D. Water Quality-Based Effluent Limits – cont. (FY2003)</b>	<b>Yes</b>	<b>No</b>	<b>N/A</b>
3. Does the fact sheet provide effluent characteristics for each outfall?	X		
4. Does the fact sheet document that a “reasonable potential” evaluation was performed?	X		
a. If yes, does the fact sheet indicate that the “reasonable potential” evaluation was performed in accordance with the State’s approved procedures?	X		
b. Does the fact sheet describe the basis for allowing or disallowing in-stream dilution or a mixing zone?	X		
c. Does the fact sheet present WLA calculation procedures for all pollutants that were found to have “reasonable potential”?	X		
d. Does the fact sheet indicate that the “reasonable potential” and WLA calculations accounted for contributions from upstream sources (i.e., do calculations include ambient/background concentrations)?			X
e. Does the permit contain numeric effluent limits for all pollutants for which “reasonable potential” was determined?	X		
5. Are all final WQBELs in the permit consistent with the justification and/or documentation provided in the fact sheet?	X		
6. For all final WQBELs, are BOTH long-term AND short-term effluent limits established?	X		
7. Are WQBELs expressed in the permit using appropriate units of measure (e.g., mass, concentration)?	X		
8. Does the record indicate that an “antidegradation” review was performed in accordance with the State’s approved antidegradation policy?	X		

<b>II.E. Monitoring and Reporting Requirements</b>	<b>Yes</b>	<b>No</b>	<b>N/A</b>
1. Does the permit require at least annual monitoring for all limited parameters and other monitoring as required by State and Federal regulations?	X		
a. If no, does the fact sheet indicate that the facility applied for and was granted a monitoring waiver, AND, does the permit specifically incorporate this waiver?			X
2. Does the permit identify the physical location where monitoring is to be performed for each outfall?	X		
3. Does the permit require at least annual influent monitoring for BOD (or BOD alternative) and TSS to assess compliance with applicable percent removal requirements?		X	
4. Does the permit require testing for Whole Effluent Toxicity?		X	

<b>II.F. Special Conditions</b>	<b>Yes</b>	<b>No</b>	<b>N/A</b>
1. Does the permit include appropriate biosolids use/disposal requirements?			X
2. Does the permit include appropriate storm water program requirements?			X

<b>II.F. Special Conditions – cont. (FY2003)</b>	<b>Yes</b>	<b>No</b>	<b>N/A</b>
3. If the permit contains compliance schedule(s), are they consistent with statutory and regulatory deadlines and requirements?			X
4. Are other special conditions (e.g., ambient sampling, mixing studies, TIE/TRE, BMPs, special studies) consistent with CWA and NPDES regulations?	X		
5. Does the permit allow/authorize discharge of sanitary sewage from points other than the POTW outfall(s) or CSO outfalls [i.e., Sanitary Sewer Overflows (SSOs) or treatment plant bypasses]?		X	
6. Does the permit authorize discharges from Combined Sewer Overflows (CSOs)?			X
a. Does the permit require implementation of the "Nine Minimum Controls"?			X
b. Does the permit require development and implementation of a "Long Term Control Plan"?			X
c. Does the permit require monitoring and reporting for CSO events?			X
7. Does the permit include appropriate/ Pretreatment Program requirements?			X

II.G. Standard Conditions	Yes	No	N/A
1. Does the <b>permit</b> contain all 40 CFR 122.41 standard conditions or the State equivalent (or more stringent) conditions?	X		
<b>List of Standard Conditions – 40 CFR 122.41</b>			
Duty to comply	Property rights	Reporting Requirements	
Duty to reapply	Duty to provide information	Planned change	
Need to halt or reduce activity	Inspections and entry	Anticipated noncompliance	
not a defense	Monitoring and records	Transfers	
Duty to mitigate	Signatory requirement	Monitoring reports	
Proper O & M	Bypass	Compliance schedules	
Permit actions	Upset	24-Hour reporting	
		Other non-compliance	
2. Does the permit contain the additional standard condition (or the State equivalent or more stringent conditions) for POTWs regarding notification of new introduction of pollutants and new industrial users [40 CFR 122.42(b)]?	X		

**Part II. NPDES Draft Permit Checklist (FY2003)**

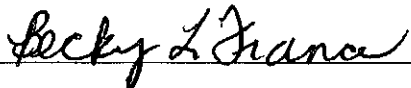
**Region III NPDES Permit Quality Review Checklist – For Non-Municipals**

*(To be completed and included in the record for all non-POTWs)*

-----NOT APPLICABLE-----

### Part III. Signature Page (FY2003)

Based on a review of the data and other information submitted by the permit applicant, and the draft permit and other administrative records generated by the Department/Division and/or made available to the Department/Division, the information provided on this checklist is accurate and complete, to the best of my knowledge.

Name	<u>Becky L. France</u>
Title	<u>Water Permit Writer</u>
Signature	<u></u>
Date	<u>10/12/12</u>